MENTON
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State Associations and Other Organizations Entitled to Representation Should Not Overlook the Appointment of Delegates to the House of Delegates, A. Ph. A., the Conference of Pharmaceutical Secretaries and Conference of Pharmaceutical Law Enforcement Officials—Miami, Fla., during Week of July 27th.

Vol. XX, No. 5 MAY, 1931

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 79th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN MIAMI, FLA., DURING WEEK OF JULY 27th. HEADQUARTERS, COLUMBUS HOTEL. LOCAL SECRETARY, G. H. GROMMET, 2364 S. W. 11th ST., MIAMI.

The 1931 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries and of Pharmaceutical Law Enforcement Officials will also be held at Miami, same time and place. The Plant Science Seminar will be held at Gainesville, Fla., during the week of July 20th.

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MIAMI—THE A. PH. A. CONVENTION CITY.

THE AMERICAN PHARMACEUTICAL ASSOCIATION will hold its 79th annual meeting in Miami, beginning July 27th. Miami is always comfortable, enjoying an oceanic climate with low degree of humidity. In summer the prevailing winds are from the east and northeast, bringing water-cooled breezes from over the ocean; there are no extremes in temperature or humidity in Miami—there is natural beauty and man-made comfort. Miami presents the beauty of architecture in its homes and hotels, and of landscaping in its gardens and parks. Every known sport is available—golf, tennis, boating, fishing, etc.

TRIP TO HAVANA AFTER THE MEETING.

The trip to Havana starts on Saturday morning, August 1st, *via* Florida East Coast Railway—a daylight ride over the Florida Keys, across the Gulf Stream to Havana, arriving there in the evening. A reception has been planned at the Hotel Sevilla Biltmore where arrangements have been made for your stay.

Sunday—the churches bid you welcome; an automobile tour has been provided, visiting points of interest, and English-speaking guides will accompany the party. At night, Havana, in all her gaiety, will be seen with an auto ride; you will see the night life, visit the beautiful clubs and the exclusive residential districts.

Monday morning a visit will be made to Morro Castle and Cabanas Fortress. In the afternoon a tour will reveal to the visitor the exotic beauty of the flora of the tropics, the Tropical Gardens will be visited.

Tuesday's program includes a 150-mile auto trip to Mantanzas and Bellamar caves, passing through many Cuban villages, forests and plantations. The caves are said to be more interesting than Mammoth; at Montserrat Hermitage a view may be had of Yumuri Valley, one of the most beautiful scenes of the world. The return will be made in time for dinner.

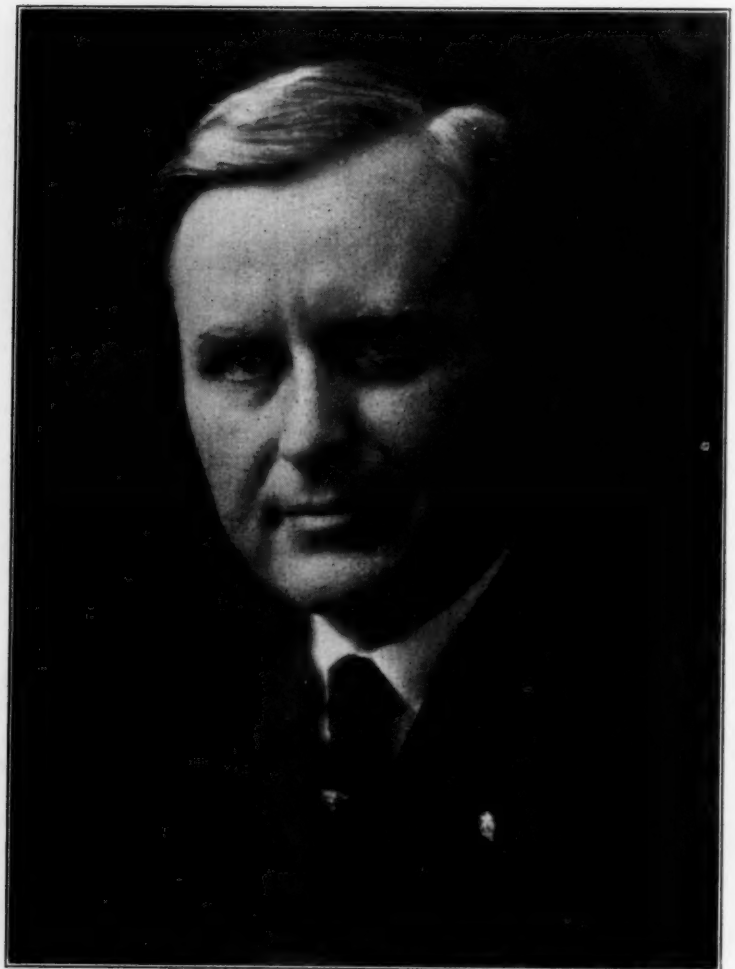
No passports are required in Cuba, traveler's cheques are accepted; it is permitted to bring back merchandise to the value of $100.

Wednesday morning the return trip is made to Miami, reaching there at 9:30 P.M.

The Cuban trip costs $75 per person for the round trip: transportation, Pullman seats, stateroom and luncheon on steamer, transfer of hand baggage, including tips, tourist tax, room at the Hotel Sevilla Biltmore with private bath.

For complete program and information write early to

C. C. Merrill, *Chairman* Havana Tour Committee,
2364 S. W. 11th St., Miami, Fla.



Courtesy Southern Pharmaceutical Journal

JAMES M. PENLAND.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XX MAY, 1931 No. 5

THE PRESIDENT OF THE NATIONAL WHOLESALE DRUGGISTS' ASSOCIATION.

James M. Penland is a native of North Carolina; however, records show that before he celebrated his first birthday he adopted Texas as a good state in which to live. His parents settled near Whitewright where Jim, before he had completed his teens, entered the employ of Howard & May. Later, he formed a partnership and established a drug store in Whitewright. Thereafter Mr. Penland became a member of the sales force of the Texas Drug Company and then entered the employ of Meyer Bros. Drug Company as traveling representative.

In 1911 he organized the Waco Drug Company, of which corporation he was president until the organization of the Southwestern Drug Corporation, which operates five wholesale drug houses in Texas; Mr. Penland is the president.

It will readily be discovered that the subject of this brief sketch has grown up with the drug business and pharmacy of Texas, willing always to render service, and in order that he might serve in a larger way he has contributed to the progress of the National Wholesale Druggists' Association, of which he is now the president. Mr. Penland has held many other positions of importance in this organization, and he is a tireless worker in every appointment accepted by him; frankness and honesty characterize the man and modesty bespeaks his merit.

Mr. Penland was a dollar-a-year man during the War, he brought the great army camps to Waco and gave the Government most of his time during the duration of the War. He has been regent of Baylor University for a number of years and is a former president of Waco Chamber of Commerce. He regards service a duty of citizenship and of individuals for the activities in which they are engaged.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

ORGANIZATION OF THE NATIONAL INSTITUTE OF HEALTH.

THE last Congress enacted two laws which have great possibilities in the promotion of Public Health activities. The National Institute of Health was created by the enactment of the Ransdell Bill and the purpose is to engage in pure research investigations of diseases and other matters pertaining to Public Health. The author of the bill, former Senator Joseph E. Ransdell, repeated, in substance, remarks—made by him in Congress, when he recently addressed the Parent-Teacher Association in Washington—that "Here, under a commander-in-chief, will be marshaled the Nation's army of experts in the science of medicine, surgery, psychiatry, dentistry, chemistry, physics, biology, bacteriology, *pharmacy* and all allied professions in a concentrated drive to prevent disease by ascertaining the cause and applying preventive measures in advance of its outbreak." In other words the public health profession and all branches of science will concentrate upon the problems pertaining to the health of man. While pharmacy has not received recognition in the appointments mentioned below, Senator Ransdell, who is the executive director of the Conference Board, had the importance of pharmacy in mind when he prepared the legislation which has provided for the National Institute of Health and will, no doubt, in coöperation with the Surgeon General, who has repeatedly expressed his favorable opinion relative to the important service of pharmacy, see that pharmaceutical service will have due recognition, as the work of this great undertaking progresses.

It will be recalled that the AMERICAN PHARMACEUTICAL ASSOCIATION passed the following resolution at the 1930 meeting, held in Baltimore:

> "WHEREAS, the Parker Bill, recently passed by the Congress and signed by the President, provides for the formation of an Advisory Council in the United States Public Health Service, and
>
> "WHEREAS, pharmacists render a valuable service in connection with the preservation and improvement of the public health, be it
>
> "*Resolved*, that the AMERICAN PHARMACEUTICAL ASSOCIATION suggest to the proper officials of the Government the advisability of including a representative pharmacist in the membership of the Advisory Council."

Similar action was taken by other National and State pharmaceutical associations.

The members of the new National Advisory Health Council, created by the act of Congress in the passage of the Parker Bill, to advise with the Surgeon General of the U. S. Public Health Service on matters pertaining to the health of the country at large, have been appointed. Four members of the advisory committee of the old Hygienic Laboratory who will serve on the council are: Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research; Dr. M. P. Ravenel, professor of bacteriology at the University of Missouri; Dr. M. J. Rosenau, professor of public health and hygiene at the Harvard Medical School, and Dr. William H. Welch, of the Johns Hopkins University. The other members are: Dr. W.

S. Leathers, dean of Vanderbilt University School of Medicine; Dr. Haven Emerson, professor of public health and hygiene at Columbia University; Professor S. C. Lind, head of the department of chemistry, University of Minnesota; Dr. W. H. Howell, director of the Johns Hopkins School of Hygiene; Dr. C. E. A. Winslow, professor of public health at Yale University, and Dr. Alfred Stengel, professor of the practice of medicine at the University of Pennsylvania.

Executive Director Joseph E. Ransdell has recently announced the members of The Conference Board of the National Institute of Health, an unofficial, voluntary body to assist the Public Health Service, as follows: Francis P. Garvan, president of the Chemical Foundation; Dr. C. H. Herty, Consulting Chemist; Dr. W. H. Welch, Johns Hopkins; Dr. H. H. Young, Baltimore; Dr. Frank Billing, Chicago; Dr. J. C. Merriam, head of the Carnegie Institute; F. A. Delano, philanthropist and civic worker, Washington.

The hygienic laboratory of the Public Health Service was turned over to the National Institute of Health and adjoining land will be used for additional buildings. This will become the third institution created by Congress that will be allowed to receive donations for specific or general purposes in connection with the work; the other two are the Smithsonian Institution and the Library of Congress. Donations of $500,000 or more are to be acknowledged by suitable memorials. The Chemical Foundation has given the Institute $100,000, for chemical research relating to health. The work of the National Institute of Health will come under the direction of the Surgeon General and the Public Health Service, and research problems relating to diseases of man will be studied throughout the world by delegated specialists.

The AMERICAN PHARMACEUTICAL ASSOCIATION has an interest in everything that promotes public health service and has been pleased to coöperate in the promotion of the measures commented upon. The site for the American Institute of Pharmacy building is in close proximity to that of the National Institute of Health.

PHARMACY WEEK.

CHAIRMAN Robert J. Ruth is busily engaged for the Pharmacy Week of 1931. One of the features will be another map—the third; the first map was a drug map of the World; the second a chemical map of North America; the one of this year will show the United States and the southern portion of Canada. On the face of the map will appear the names of all cities where colleges of pharmacy are located. Under the name of each college a brief history will be given, together with the investments represented by each institution.

On the face of the map will be half-tones of the deans and around the border of the map pictures of the schools and colleges of pharmacy, campus, laboratories, etc. The names of the schools will be given in alphabetical order, and the investments represented thereby for training pharmacists to serve and protect the public and in the interest of public health.

The Committee has given publicity to other features of Pharmacy Week and others will be announced later; the purpose of this comment is to direct attention to the educational value of the observance.

PHARMACY SCHOOLS AND COLLEGES AND THEIR ALUMNI.

COMMENCEMENTS mark periods in the lives of men and women and of the activities in which they are engaged. "Each graduate who goes out is either an asset or a liability to the institution and to the profession for which he has been educated." The two statements speak, in a degree, for what pharmacy may be or will be; it is a potential relation for shaping pharmacy provided the institutions and the alumni work together, with the public as an influence that must be taken into consideration. The status of a profession cannot be changed over night, for present conditions are to a large extent due to the activities of pharmacists who preceded and pharmacy of a decade hence is being shaped by pharmacists of to-day. The question—"what will you make of pharmacy?"—is one that can only be answered jointly, by both the educational institutions and the alumni. Each alumnus is either an asset or a liability to the institution and to the profession, and this measure can be reversely applied.

An incident is recalled; seemingly it was an incident, for acts of the kind do not occur very often. This young man had worked his way through college and several years after graduation gave to his Alma Mater $1000 "as an expression of his gratitude" to the institution that gave him the educational equipment wherewith he faced the world. "His attitude of mind may not be unusual, but his practical exemplification of his theory goes much further than most baccalaureates are willing to carry their loyalty."

YOUNG MEN TO THE FRONT.

ON TWO recent occasions I have had my attention called to the number of young men who were interesting themselves in the organization work of the sciences of chemistry and pharmacy. At the Indianapolis meeting of the American Chemical Society, I was impressed with the great number of young chemists that attended, closely followed and took part in the programs of the different sectional meetings. It occurred to me that such a condition augurs well for the future of that Society. At a recent conference of pharmacists, a goodly part of the program was handled by young men of the profession and these young men acquitted themselves splendidly.

Wisdom is usually associated with age, and age surely tempers impetuosity and over-enthusiasm, bringing them to the point where their efficiency is at its best. However, when one of our most important universities selects for its president a man in his early thirties, we are constrained to stop and consider whether age is not used too much as a criterion for usefulness in the organizations of pharmacy.

All of us are aware of the fact that when we attend a meeting of the American Association of Colleges of Pharmacy, National Association of Boards of Pharmacy or the AMERICAN PHARMACEUTICAL ASSOCIATION we meet the "old wheel horses" of these organizations and we are all glad that this is so, because these older members have a guiding hand in the operation of these organizations that is necessary to their successful function. If we were to select ten of the most active from each organization, I believe we would be surprised to find that we have selected most

of the active participants in their deliberations. Is this for the best interest for the future of these organizations and of pharmacy?

The younger members of our organizations are not as regular in attendance as we would wish and as they should be for the best interest of pharmacy. This is perhaps due to the fact that the younger members feel that they are not in a financial position to pay the expenses of attendance. I am sure that no youthful member has ever had a reason to believe that he is not welcome to attend and to participate in our deliberations. However, are we doing our full duty in urging these younger men to attend and participate in the activities of these organizations, or are we content in allowing the official reports of these meetings to satisfy their youthful enthusiasm for our profession? If the latter be true, I believe we should not be surprised that their ardor cools with time.

The inspiration that a young man will receive by attendance on and participation in our deliberations is immeasurable and we cannot afford to let any opportunity to secure his attendance pass without doing our full share toward securing such attendance and participation. Let every regular attendant at these meetings pledge himself to do his utmost to bring at least one of the younger and enthusiastic neophytes of our profession with him to our next meeting and see to it that he has the opportunity to meet and associate with the men who are in the forefront of the work. If this be done, American Pharmacy will reap ten-fold benefit for any effort that it costs.—C. B. JORDAN, *Chairman*, House of Delegates, A. PH. A.

THE AMERICAN ASSOCIATION OF MUSEUMS.

The annual meeting of the American Association of Museums will be held at Pittsburgh on May 21st–23rd, according to *Museum News*. General and group sessions are designed for delegates from museums of all kinds throughout the country. A general session each morning will be devoted to a topic of equal interest to museums of art, science, history and industry. Each afternoon session will be given over to a single paper introductory to inspection of one of the host museums or of some other branch of the Carnegie Institute. On two evenings six groups will hold separate sessions. At these group sessions more specialized topics will be considered, but in the aggregate a wide variety of subject matter will be covered. The groups are the technical section, the scientific section, the superintendents' section, the art group, the educational group and the public relations group.

Important features of the meeting will be the 25th anniversary dinner on the third evening, and the exhibit of the technical section. The exhibit will be open for inspection throughout the meeting.

The general session of the first morning will take up branch museums with papers on the different kinds of branches already to be found and general treatment of the needs and future. The second morning session will be on international outlooks, with presentations from the European and the American standpoints and a critical comparison of views. The third general session, on the last morning, will take up outdoor education from the standpoints of science, history and art museums. At this session also there will be a single paper and discussion on a particular field—that of industrial museum exhibits.

Proposals for participation in the technical section exhibit are being received by Remi M. Santens, Carnegie Museum, Pittsburgh, vice-chairman of the section. The exhibit will include models, miniature groups, manikins, photographs, drawings, paintings, case displays and designs. All members of the section who desire to submit objects for display should communicate with Mr. Santens.—Through *Science*, May 1st.

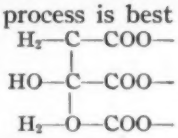
SCIENTIFIC SECTION

THE PREPARATION OF WATER-SOLUBLE SODIUM BISMUTH CITRATE.*

BY W. F. VON OETTINGEN.

In a previous paper (1) it was shown that a modification of the Fabrègue process yields mono bismuthyl citric acid, which under certain conditions forms with sodium hydroxide a dibismuthyl sodium citrate. The second part of this reaction is, however, rather complex, and it was shown that equimolecular quantities of dibismuthyl monosodium citrate and sodium citrate are formed. With this process the yield of a pure material is small, because the two compounds can only be separated by means of fractional precipitation with alcohol.

For this reason it seemed to be desirable to prepare a dibismuthyl citric acid and, by dissolving this in sodium hydroxide, the dibismuthyl mono sodium citrate. Telle (2) obtained a neutral bismuth citrate by boiling equimolecular parts of bismuth hydroxide and nitric acid in aqueous solution for five minutes. It appeared, therefore, feasible that, by changing the molecular quantities and the conditions, a dibismuthyl citric acid could be prepared. In order to obtain a pure preparation, it was necessary to start with a pure bismuth hydroxide which can be prepared by the method of Vanino and Zumbusch (3). The process is best illustrated by the following equations, in which the citric acid radicle is represented by the abbreviation Ci:



(1) $$Bi(NO_3)_3.5H_2O + 3NaOH = Bi(OH)_3 + 3NaNO_3$$

(2) $$2Bi(OH)_3 + Ci\begin{matrix}H\\H\\H\end{matrix} = Ci\begin{matrix}Bi(OH)_2\\H\\H\end{matrix} + 2H_2O$$

(3) $$Ci\begin{matrix}Bi(OH)_2\\Bi(OH)_2\\H\end{matrix} = NaOH = H_2O = Ci\begin{matrix}Bi(OH)_2\\Bi(OH)_2\\Na\end{matrix}$$

(4) $$Ci\begin{matrix}Bi(OH)_2\\Bi(OH)_2\\Na\end{matrix} - H_2O = Ci\begin{matrix}BiO\\BiO\\Na\end{matrix}$$

Freshly prepared moist bismuth hydroxide is shaken with half the molecular equivalent of citric acid until the supernatant fluid is neutral or only slightly acid. Under these conditions, as will be shown below, dibismuthyl citric acid is formed, which is dissolved in sodium hydroxide with the formation of the dibismuthyl monosodium citrate, which is then precipitated by the addition of alcohol.

In detail the preparation is as follows:

(*a*) *Preparation of Bismuth Hydroxide.*—Ninety-seven grams corresponding to $^2/_{10}$ moles of bismuth nitrate are dissolved together with 40 Gm. of mannite in

* From the Department of Pharmacology of the School of Medicine, Western Reserve University, Cleveland, Ohio.

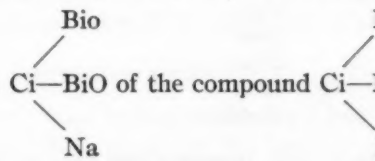
200 cc. of water and poured into an ice-cooled solution of 96 Gm. sodium hydroxide in 200 cc. of water of less than 5° C. If the two solutions are mixed slowly with continuous stirring, the temperature should not rise above 30° C., and the liquid should remain clear. After the mixture has been allowed again to cool below 5° C., ice-cold diluted 10 per cent sulphuric acid is added, until the mixture is nearly neutral (p_H 7.2). During this acidulation the bismuth hydroxide is precipitated. At the end of the reaction, it is filtered off, washed with water and several times resuspended in water, filtered and washed again until the diphenylamine test for nitric acid has become negative. The bismuth hydroxide represents a more or less colloidal substance, which after drying on clay plate forms a white amorphous powder, the purity of which may be illustrated by the following analysis:

Substance: 0.4976 Gm. = Bi_2S_3 0.4957 = 80.6 per cent Bi
Substance: 0.5004 Gm. = Bi_2S_3 0.4970 = 80.4 per cent Bi
Calculated for $Bi(OH)_3H$: 80.3 per cent Bi.

(*b*) *Preparation of Dibismuthyl Citric Acid.*—The undried bismuth hydroxide is transferred to a shaking container and half the equimolecular quantity (19 Gm.) of citric acid dissolved in 100 cc. of water is added. This mixture is kept for some days with occasional shaking on the shaking machine for some hours, until equilibrium has been established, *i. e.*, until all citric acid has been bound and the supernatant fluid is neutral, or only slightly acid to litmus paper. The dibismuthyl citric acid is then filtered off and washed carefully. The dried material represents a fine white powder.

Substance: 0.5016 Gm. = Bi_2S_3 0.4020 Gm. = 65.1 per cent Bi
Substance: 0.4993 Gm. = Bi_2S_3 0.4000 Gm. = 65.1 per cent Bi
Calculated for $Ci(BiO)_2$: 65.2 per cent Bi.

(*c*) *Preparation of Dibismuthyl Monosodium Citrate.*—The undried dibismuthyl citric acid is transferred into a beaker with 100–200 cc. of water and by constant stirring transformed into a homogeneous magma. A few cc. of phenol red solution (0.04%) are added and sodium hydroxide is then added from a burette, with constant stirring, until the material is dissolved. Usually a little more than one mole sodium hydroxide is required for this purpose. Sometimes a more or less marked turbidity persists, which is due to small quantities of bismuth hydroxide, which did not react during process *b*, or which were formed by the too rapid addition of the sodium hydroxide. In order to prevent the latter the p_H should be watched carefully, and the mixture should never become more alkaline than p_H 7.6. This turbidity is filtered off by passing the material several times through a layer of kaolin until it appears perfectly clear. From this solution the dibismuthyl sodium citrate is then precipitated by the addition of alcohol, filtered off, washed and dried. During the drying, the gelatinous precipitate assumes a glassy appearance and can be ground in a mortar to a white amorphous powder. This dried material has to be considered as the anhydride



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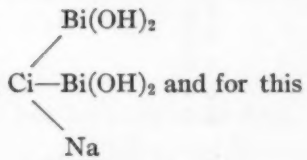

and for this reason it is rather hygroscopic. The yield ranges from 70–80 per cent.

Substance: 0.4804 Gm. = Bi_2S_3 0.3726 = 62.9 per cent Bi
Substance: 0.4795 Gm. = Bi_2S_3 0.3702 = 62.7 per cent Bi
Calculated for $Ci(BiO)_2Na$ = 63.0 per cent Bi

(*d*) *Precautions.*—Occasionally the bismuth content of the final product is too high, ranging from 63.9 to 66 per cent of bismuth, presumably due to adsorbed bismuth hydroxide. Such preparations can be purified by dissolving the material in water, filtering through kaolin and reprecipitating with alcohol.

Comparison of the physico-chemical properties of the dibismuthyl monosodium citrate obtained with the new and the old process.

Although the bismuth content of the dibismuthyl monosodium citrate, obtained with the method just described, was the same as that of the preparation obtained with the modified Fabrègue process, it seemed necessary to check the physico-chemical properties of the two compounds, in order to make sure that they are identical.

Effect of Heat.—2.5 per cent solutions of the two preparations containing 0.5 cc. of phenol red per 10 cc. as indicator were heated in sealed test-tubes to 50°, 100° and 150° C. for one-half, one and one and a half hours, and the changes of the p_H and changes of the solution were recorded.

TABLE I.—EFFECT OF HEAT ON 2.5 PER CENT SOLUTIONS OF DIBISMUTHYL MONOSODIUM CITRATE OBTAINED WITH THE NEW AND WITH THE OLD METHOD.

		New Preparation.		Old Preparation.	
Temperature.	Time.	p_H.	Precipitate.	p_H.	Precipitate.
50	30	7.4	No	7.6	No
	60	7.4	No	7.6	No
	90	7.4	No	7.6	No
100	30	7.4	No	7.3	Slight turb.
	60	7.4	No	7.3	Slight turb.
	90	7.4	No	7.3	Slight turb.
150	30	7.2	Mass. prec.	7.3	Mass. prec.

Table I shows that both solutions have practically the same stability toward heat, the slightly more alkaline preparation obtained with the older method being somewhat less resistant. When, however, both solutions are adjusted to the same p_H 7.4, this difference disappears, so that it may be stated that both preparations show the same resistance toward heat.

TABLE II.—EFFECT OF HYDROGEN-ION CONCENTRATION ON 2.5 PER CENT SOLUTIONS OF DIBISMUTHYL MONOSODIUM CITRATE OBTAINED WITH THE NEW AND THE OLD METHOD.

p_H.	New preparation.	Old preparation.
9.24	Mass. prec.	Mass. prec.
8.2	Distinct prec.	Distinct prec.
8.0	Distinct turb.	Distinct turb.
7.9	Slight turb.	Slight turb.
7.6	Clear	Clear
7.0	Clear	Clear
6.4	Clear	Clear
6.0	Clear	Clear
5.4	Clear	Clear
5.0	Turbid	Turbid

Table II shows that both preparations behave exactly alike toward change of the hydrogen-ion concentration, so that it appears that they are identical.

Effect of Changes of the Hydrogen-Ion Concentration.—In these experiments 10-cc. samples of the two solutions containing 0.5 cc. phenol red solution were adjusted to different p_H by the addition of small quantities of $N/10$ hydrochloric acid or $N/10$ sodium hydroxide.

SUMMARY.

A method is described, which allows the preparation of pure dibismuthyl monosodium citrate, with a good yield.

The preparation obtained with this method is identical with the compound obtained with the modified Fabrègue method.

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AMINOALCOHOLS VI—A STUDY OF THE ACTION OF PHENYLPROPANOLAMINE UPON THE BLOOD SUGAR OF RABBITS.*

BY JOHN C. KRANTZ, JR., AND WALTER H. HARTUNG.

INTRODUCTION.

It was established years ago by Blum (1) that injections of a solution of epinephrine caused hyperglycemia and often glycosuria. For some time it was considered that the elevation of the blood-sugar level was caused by increased glycoginolysis in the liver (2). Recent investigations by Cori (3) using more refined analytical methods indicate that the importance of the liver in the hyperglycemia is only secondary and further that the factor of primary importance in producing the accumulation of sugar in the blood is the decreased utilization of the sugar in the peripheral tissues.

Since the introduction of ephedrine into clinical medicine by the classical investigations of Chen and Schmidt (4), Wilson (5) at the suggestion of Chen studied the effect of this compound related to epinephrine upon the blood sugar of dogs and rabbits and observed a definite hyperglycemia. This action is claimed by Nagel (6) to be characteristic of the sympathomimetic amines.

Out of these Research Laboratories has come a series of synthetic arylalkanolamines (7) which because of their analogy to and homology with ephedrine were examined as to their effect on blood sugar in rabbits. Since phenylpropanolamine, a primary amine, has a pharmacological action much like that of ephedrine (Chen 8), a secondary amine, and because of its possible therapeutic interest, the effect of this compound was examined more extensively than the others.

METHOD OF STUDY.

Rabbits were starved twenty-four hours prior to the administration of the drug. The blood-sugar determinations were made by the method of Shaffer and Hart-

*Scientific Section, A. PH. A., Baltimore meeting, 1930.

mann (9). The maximum rise or fall of blood was found to occur in practically all instances within 30 to 70 minutes after the intravenous injections.

The therapeutic doses of phenylpropanolamine hydrochloride which were found to influence the blood-sugar level of rabbits when administered intravenously were from 20 to 30 mg. per kilo. Studies were also made of the influence on blood sugar when this compound were administered subcutaneously and orally.

RESULTS.

Table I records the changes in the blood-sugar level of rabbits after intravenous injections of phenylpropanolamine hydrochloride.

TABLE I.—CHANGES IN THE BLOOD SUGAR OF RABBITS CAUSED BY INTRAVENOUS INJECTIONS OF PHENYLPROPANOLAMINE HYDROCHLORIDE.

Wt. of rabbit, Kg.	Dose, mg./Kg.	Fasting blood sugar, mg. per 100 cc.	Blood sugar 30 min. after injection.	Blood sugar 70 min. after injection.
2.3	30	120	106	103
1.7	40	101	137	127
1.7	40	104	122	98
3.0	40	98	116	106
1.8	40	109	151	146
2.0	40	116	124	132
1.7	20	95	101	82
2.0	30	104	95	95
1.5	30	104	140	124
1.6	30	98	89	87
2.2	20	104	82	87
3.5	20	106	92	89
3.2	30	111	101	95
2.1	30	92	101	101
3.0	20	92	76	104
3.2	20	101	82	89
2.0	25	92	114	114
2.0	25	106	116	89
1.3	25	95	106	116
1.9	25	116	119	114
1.9	25	98	104	89
1.9	25	114	119	109
1.9	25	106	114	119
1.2	30	116	132	109
1.2	30	122	127	114
1.2	30	127	116	114
1.8	25	116	151	124
2.1	25	106	132	106
2.1	25	98	106	111
1.8	25	119	116	104
1.8	25	109	119	109
1.8	25	124	114	101

The results tabulated in Table I indicate that the injection of 20 to 30 mg. of phenylpropanolamine hydrochloride influences the blood-sugar level of rabbits. The influence is not marked and may be either hypo or hyperglycemic.

Chart I shows the frequency of occurrence and the degrees of hyper and hypoglycemia produced by these injections.

With intravenous injections of ephedrine sulphate in rabbits' dose 20 to 30 mg. per kilo Wilson (5) found variable but definite hyperglycemic action. Thus in two rabbits with doses of 30 mg. per kilo he obtained significant rises in blood sugar of 92 and 65 mg. Repeating the experiment of Wilson on three rabbits using the same time intervals as were employed (in the experiments) with phenylpropanolamine hydrochloride definite hyperglycemic activity was observed in only one of the three rabbits as shown in Table II.

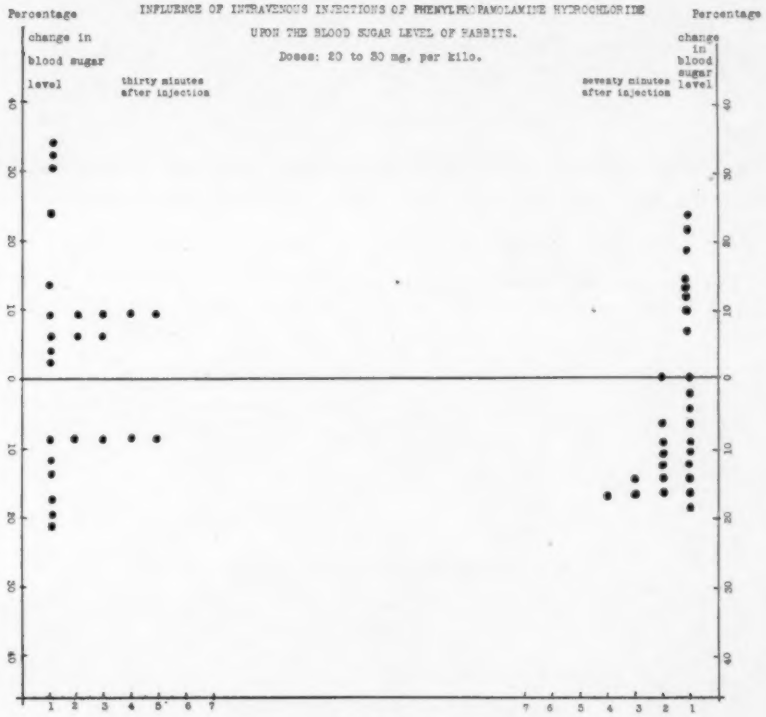
Percentage change in blood sugar level
INFLUENCE OF INTRAVENOUS INJECTIONS OF PHENYLPROPANOLAMINE HYDROCHLORIDE UPON THE BLOOD SUGAR LEVEL OF RABBITS.
Doses: 20 to 30 mg. per kilo.
thirty minutes after injection
seventy minutes after injection
Percentage change in blood sugar level

Chart I.

TABLE II.—THE ACTION OF INTRAVENOUS INJECTIONS OF EPHEDRINE SULPHATE UPON THE BLOOD-SUGAR LEVEL OF RABBITS.

Wt. in kilo.	Dose per kilo mg.	Fasting blood sugar of rabbit, mg. per 100 cc.	Blood sugar 30 min. after injection.	Blood sugar 70 min. after injection.
1.6	25	106	109	104
1.3	25	92	106	95
1.7	25	116	143	122

TABLE III.—THE ACTION OF SUBCUTANEOUS INJECTIONS OF PHENYLPROPANOLAMINE HYDROCHLORIDE UPON THE BLOOD-SUGAR LEVEL OF RABBITS.

Wt. in kilo.	Dose, mg./Kg.	Fasting blood sugar of rabbits, mg. per 100 cc.	Blood sugar 1 hr. after injection.	Blood sugar 2 hrs. after injection.
2.4	100	104	119	119
1.8	100	106	98	101
2.8	100	109	101	101
2.1	100	132	114	111

Further experiments were conducted with phenylpropanolamine hydrochloride upon rabbits studying its influence upon the blood-sugar level when administered subcutaneously and orally.

The results of these experiments are shown in Tables III and IV.

TABLE IV.—THE ACTION OF PHENYLPROPANOLAMINE HYDROCHLORIDE UPON THE BLOOD SUGAR OF RABBITS ADMINISTERED ORALLY.

Wt. in kilo.	Dose, mg./Kg.	Fasting blood sugar of rabbit, mg. per 100 cc.	Blood sugar 1 hr. after dose.	Blood sugar 25 hrs. after dose.
2.6	200	87	111	89
2.1	200	71	76	79
2.8	200	82	89	79
1.8	200	84	74	76
2.4	200	82	87	92

The action of certain compounds homologous to phenylpropanolamine were studied by intravenous injections. The results of these experiments are recorded in Table V.

TABLE V.—THE ACTION OF INTRAVENOUS INJECTIONS OF CERTAIN HOMOLOGS OF PHENYLPROPANOLAMINE UPON THE BLOOD SUGAR OF RABBITS.

A.

Phenylbutanolamine Hydrochloride.

Wt. in kilo.	Dose, mg./Kg.	Fasting blood sugar of rabbit, mg. per 100 cc.	Blood sugar 30 min. after injection.	Blood sugar 70 min. after injection.
1.9	25	100	113	94
2.3	25	85	100	117

B.

Phenylhexanolamine Hydrochloride.

1.7	25	98	Died	...
3.0	20	82	124	146

C.

p-Tolyl Propanolamine Hydrochloride.

2.3	20	109	180	220
3.2	20	76	84	111

DISCUSSION OF RESULTS.

The frequency chart showing the influence of intravenous injections of phenylpropanolamine hydrochloride upon blood sugar shows the following trends: Thirty minutes after injection, the tendency of activity is toward a mild hyperglycemia in most instances, approximately 60 per cent, resulting in a rise of about 10 mg. per 100 cc. of blood. Seventy minutes after injection, the tendency of the blood sugar level is to fall below the fasting level, most of these determinations indicate a fall of about 18 mg. When administered subcutaneously (100 mg. per kilo) or orally (200 mg. per kilo) the drug is without appreciable effect upon the blood-sugar level of rabbits. The marked hyperglycemic action of ephedrine sulphate reported by Wilson (5) was not observed in the three rabbits used; the hyperglycemia was practically negligible in two cases, but in no instance was there a fall below the normal blood sugar as occurred in some cases with phenylpropanolamine hydrochloride.

The injections of phenylbutanolamine hydrochloride and phenylhexanolamine hydrochloride seem to indicate that their actions are hyperglycemic. The introduction of the methyl into the aromatic nucleus, as in *p*-tolylpropanolamine hydrochloride, produces marked hyperglycemic activity when injected intravenously. These results indicate that possibly an interesting relationship between hyperglycemic activity and homology might be revealed by a more comprehensive study of the compounds of this series, and such a study will be undertaken in these laboratories.

SUMMARY.

1. The action of phenylpropanolamine hydrochloride upon the blood sugar level of rabbits has been studied intravenously, subcutaneously and orally.

2. The action of certain homologs of phenylpropanolamine has been studied intravenously.

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RESEARCH LABORATORIES,
SHARP & DOHME.

PHYTOCHEMICAL NOTES.*,**

NO. 105. MONARDA PUNCTATA, L.†

BY A. A. HARWOOD.

For the purpose of supplementing earlier chemical work on this species, it seemed desirable to subject the several parts of the plant to a preliminary chemical examination. More particularly did it seem important to acquire some understanding of the inorganic constituents because of the possible relation these may have to the thymol-carvacrol isomerism of the two species *M. punctata* and *M. fistulosa*.

The Root.—Two moisture determinations yielded 4.0 p. c. and 4.5 p. c., respectively, in the air-dried material when determined by the xylene method. The same material yielded the following amounts of ash in two determinations.

	I.	II.
Water-soluble ash	0.96 p. c.	1.03 p. c.
Water-insoluble ash	6.67 " "	4.71 " "
Total ash	7.63 " "	5.74 " "

* Part of a thesis submitted for the degree of Doctor of Philosophy, University of Wisconsin.
** From the laboratory of Edward Kremers.
† See also THIS JOURNAL, 18 (1929), 228; 19 (1930), 1171.

The water-insoluble ash resolved itself into:

Acid soluble	1.52 p. c.	1.31 p. c.
Acid insoluble	5.15 " "	3.40 " "

Upon analysis, the ash revealed the presence of the following elements and groups, the percentage, as above, being computed with reference to the air-dried material from which the ash had been obtained:

	I.	II.		I.	II.
Ca	0.25 p. c.	0.24 p. c.	CO_3	0.21 p. c.	0.22 p. c.
Mg	0.02 " "	0.02 " "	SO_4	0.132 " "	0.144 " "
Fe	0.044 " "	0.045 " "	SiO_3	5.18 " "	5.42 " "
Al	0.06 " "	0.065 " "	Undeter-		
Cl	0.015 " "	0.014 " "	mined	1.72 " "	1.46 " "

Tests for K and Na gave positive results.

The preliminary analysis with selective solvents, according to the Dragendorff Method, yielded the following amounts of extractive on two 100-Gm. samples.

Solvent.	I.	II.
Petroleum ether	1.2 p. c.	1.6 p. c.
Ether	1.0 " "	1.0 " "
Alcohol	3.7 " "	3.0 " "
Water	2.1 " "	1.9 " "
Aqueous alkali (2 p. c. KOH)	8.6 " "	8.8 " "
Aqueous acid (1 p. c. HCl)	3.6 " "	3.6 " "
Marc	80.0 " "	82.0 " "
Total	100.2 " "	101.9 " "

The Stem.—The moisture content, when determined by the xylene method, was shown to be 5.4 p. c. and 5.6 p. c., respectively.

Two ash determinations yielded the following results:

	I.	II.
Water-insoluble ash	3.90 p. c.	3.78 p. c.
Water-soluble ash	2.18 " "	2.33 " "
Total ash	6.08 " "	6.11 " "

The water-insoluble ash contained:

Acid-insoluble ash	1.61 p. c.	1.54 p. c.
Acid-soluble ash	2.29 " "	2.24 " "

Of the more common constituents, the following were determined quantitatively:

	I.	II.		I.	II.
Mg	0.029 p. c.	0.026 p. c.	CO_3	0.59 p. c.	0.61 p. c.
Ca	0.430 " "	0.430 " "	SO_4	0.31 " "	0.29 " "
Fe	0.085 " "	0.085 " "	SiO_2	1.68 " "	1.61 " "
Al	0.11 " "	0.11 " "	Undeter-		
Cl	0.032 " "	0.039 " "	mined	2.84 " "	2.91 " "

The preliminary analysis with selective solvents, according to the Dragendorff Method, yielded the following amounts of extractive on two 100-Gm. samples:

Solvent.	I.	II.
Petroleum ether	0.6 p. c.	0.8 p. c.
Ether	0.3 " "	0.3 " "
Alcohol	3.2 " "	4.0 " "
Water	4.7 " "	6.6 " "
Aqueous alkali (2 p. c. KOH)	7.8 " "	7.6 " "
Aqueous acid (1 p. c. HCl)	5.0 " "	4.6 " "
Marc	80.0 " "	78.0 " "
Total	101.6 " "	101.9 " "

Aside from minor experimental errors the excess in "total" over 100 p. c. is due to the alkali introduced through one of the solvents.

The Leaf.—Two moisture determinations yielded 8.0 p. c. and 7.6 p. c., respectively.

Ash determinations of the air-dried material yielded the following results:

	I.	II.
Water-insoluble ash	10.99 p. c.	10.52 p. c.
Water-soluble ash	2.38 " "	2.77 " "
Total ash	13.37 " "	13.29 " "

The water-insoluble ash resolved itself into:

Acid-insoluble ash	4.77 p. c.	4.54 p. c.
Acid-soluble ash	6.22 " "	6.03 " "

The following quantitative determinations of ash constituents are computed with reference to air-dried material:

	I.	II.		I.	II.
Mg	0.173 p. c.	0.171 p. c.	CO_3	0.75 p. c.	0.74 p. c.
Ca	1.19 " "	1.14 " "	SO_4	0.25 " "	0.26 " "
Fe	0.14 " "	0.14 " "	SiO_3	5.78 " "	5.77 " "
Al	0.24 " "	0.23 " "	Undetermined	4.78 " "	4.85 " "
Cl	0.027 " "	0.032 " "			

The preliminary analysis with selective solvents yielded the following amount of extractive on two 100-Gm. samples:

Solvent.	I.	II.
Petroleum ether	7.5 p. c.	6.0 p. c.
Ether	4.5 " "	4.0 " "
Alcohol	2.5 " "	3.0 " "
Water	5.6 " "	6.8 " "
Aqueous alkali (2 p. c. KOH)	16.3 " "	16.6 " "
Aqueous acid (1 p. c. HCl)	5.5 " "	6.0 " "
Marc	58.0 " "	58.0 " "
Total	99.9 " "	100.4 " "

The Bract.—The moisture content, in two determinations, proved to be 4.0 p. c.

Two ash determinations yielded the following results:

	I.	II.
Water-insoluble ash	7.87 p. c.	7.81 p. c.
Water-soluble ash	3.36 " "	3.76 " "
Total ash	11.23 " "	11.57 " "

The water-insoluble ash resolved itself into:

Acid-insoluble ash	3.39 p. c.	3.30 p. c.
Acid-soluble ash	4.48 " "	4.51 " "

The quantitative determination of the ash yielded the following percentages computed with reference to air-dried material:

	I.	II.		I.	II.
Mg	0.10 p. c.	0.10 p. c.	CO_3	0.89 p. c.	0.86 p. c.
Ca	0.74 " "	0.75 " "	SO_4	0.345 " "	0.36 " "
Fe	0.10 " "	0.10 " "	SiO_3	4.15 " "	4.04 " "
Al	0.24 " "	0.24 " "	Undetermined	4.72 " "	4.82 " "
Cl	0.11 " "	0.13 " "			

The preliminary analysis with selective solvents yielded the following results:

Solvent.	I.	II.
Petroleum ether	8.6 p. c.	6.25 p. c.
Ether	2.2 " "	2.50 " "
Alcohol	20.0 " "	18.75 " "
Water	6.0 " "	5.1 " "
Aqueous alkali (2 p. c. KOH)	6.6 " "	6.0 " "
Acid (1 p. c. HCl)	7.9 " "	8.2 " "
Marc	46.2 " "	53.7 " "
Total	97.5 " "	100.50 " "

The Corolla.—The only record of a chemical study of the corolla is that of Hewitt.[1] He found 69 p. c. of water in the recently picked corollas and 6. p c. in the air-dried material. He also made ash determinations and distilled the volatile oil.

Moisture determinations on material collected in 1927 yielded 6.8 p. c. and 6.6 p. c., respectively.

Ash determinations yielded the following results, which, for ready comparison, are tabulated with those of Hewitt.

	Harwood.		Hewitt.		
	I.	II.	I.	II.	III.
Water-insoluble ash	4.09 p. c.	3.99 p. c.	6.00 p. c.	6.11 p. c.	5.52 p. c.
Water-soluble ash	6.20 " "	6.21 " "	4.86 " "	4.80 " "	4.97 " "
Total ash	10.29 " "	10.20 " "	10.86 " "	10.91 " "	10.49 " "

The water-insoluble ash resolved itself into:

	I.	II.
Acid-insoluble ash	1.36 p. c.	1.31 p. c.
Acid-soluble ash	2.73 " "	2.48 " "

Whereas the total ash in the two sets of determinations agreed there is an appreciable difference in the water-soluble and the water-insoluble ash.

The following quantitative determinations of ash constituents are computed with reference to air-dried material:

[1] Jour. A. Ph. A., 17 (1928), 457.

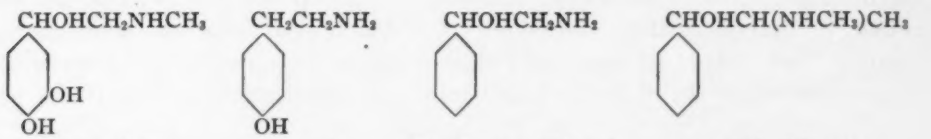
	I.	II.		I.	II.
Mg	0.046 p. c.	0.042 p. c.	CO_3	2.01 p. c.	2.03 p. c.
Ca	0.24 " "	0.24 " "	SO_4	0.27 " "	0.31 " "
Fe	0.073 " "	0.067 " "	SiO_3	1.42 " "	1.37 " "
Al	0.242 " "	0.240 " "	Undetermined	5.71 " "	5.73 " "
Cl	0.24 " "	0.22 " "			

A CHEMICAL EXAMINATION OF PARA-HYDROXYPHENYL METHYLAMINO ETHANOL HYDROCHLORIDE.*,†

BY SAMUEL M. GORDON.

The practitioner of medicine now has available as vasoconstrictor agents a number of substances. The best known of these is epinephrine, first isolated by Abel in 1897; then later by Takamine and others in pure form. The relative ease with which epinephrine undergoes oxidation and the relatively pronounced therapeutic action of very small doses of epinephrine have stimulated interest in the search for compounds having similar pharmacologic properties. The search in part has been for compounds with less pronounced pharmacologic action and greater resistance to the oxidizing influences of the air. Such work has led to the preparation of many interesting compounds. But it is worth noting that of the many compounds prepared under this stimulus, epinephrine still remains the only official drug of this group. The outstanding workers in this field have been the Edinburgh investigators, Barger and Dale. It was these workers who in a large measure clearly elucidated the relation between chemical constitution and pharmacologic properties in the group of compounds related to β-phenylethylamine. As a result of such investigations there has been made available to the clinical worker tyramine (originally isolated from ergot, but now prepared synthetically), ephedrine from the Chinese plant Ma-Huang,[1] and a more recent introduction, phenylamino ethanol, a synthetic product, for which standards have already appeared,[2] and others which are of more or less academic interest at present.

A comparison of the structural relations of these four compounds may serve to bring out the chemical similarities and conversely the differences, due to molecular structure.[3,4]



Epinephrine — Tyramine — Phenylamino Ethanol — Ephedrine

* Contribution from the American Dental Association, Bureau of Chemistry and the A. M. A. Chemical Laboratory. † The work reported herein was completed in June 1929.

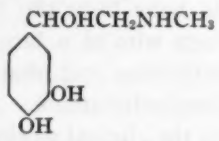
[1] The work of Chen and others has revived an interest in this long forgotten Chinese drug. Synthetic forms are now on the market, but up to now only the laevorotatory compound from the plant has been acceptable for inclusion in New and Nonofficial Remedies. Standards have been developed to rule out as far as possible all isomers except laevo ephedrine.

[2] Samuel M. Gordon, JOUR. A. PH. A., 17 (1928), 1195; also Miller and Piness, *J. Am. Med. Assocn.*, 91 (1928), 1033; and "Report of Council on Pharmacy and Chemistry," *Ibid.*, 91 (1928), 1037.

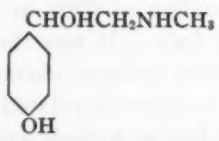
[3] Samuel M. Gordon, *loc. cit.* [4] J. B. Peterson, *Ind. Eng. Chem.*, 20 (1928), 388.

An examination of these formulas will readily reveal that the similarities in structure, while identical in the main characters, are not enough graduated to reach strictly comparable results; and indeed may serve to indicate the need for even a more systematic study of this group of compounds, before the whole story is told. The student with a leaning toward synthetic organic chemistry and pharmacology will still find here a fruitful harvest for his endeavors.[1] Newer introductions will, as is to be expected, introduce complications in the elaboration of standards of identity and purity. Axiomatically it may be stated that the closer one compound approaches another in chemical constitution the distinction will often be found quantitative rather than qualitative. This is well illustrated in the standards described at the end of this paper for the drug which is the subject of this report.

Within the past few years, there has been introduced into materia medica a substance more closely related to epinephrine than the substances previously mentioned. This compound is 4-oxyphenyl methylamino-ethanol hydrochloride. Structurally it resembles 3,4-dioxy-phenyl-methyl-amino-ethanol (Epinephrine) in all respects, but that it lacks a hydroxyl group in position 3 of the benzene nucleus. The former may be considered as a derivative of phenol; the latter of catechol. These formulas placed side by side will bring out the close similarity of the two compounds.



Epinephrine



"Desoxy Epinephrine"

It has been claimed that "desoxy epinephrine"[2] is less prone to oxidation than is epinephrine, and that pharmacologically it reacts in the same manner as epinephrine but in a lesser degree; that is, a larger dose (50–100 times) of the new compound is required to bring about an equal response.[3,4,5,6,7]

The pharmacological experiments reported by Ehrismann were made with a specimen of "desoxy epinephrine" supplied by the reputed discoverer of the compound, H. Legerlotz; those carried out by F. Lasch were made with a sample supplied by "der Wiener Chemischen Fabrik Syngala." With the exceptions noted, an examination of the literature failed to reveal any mention of a compound with

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[1] Compare K. K. Chen and Carl F. Schmidt, "Ephedrine and Related Substances," Baltimore, 1930. This monograph appeared after the experimental work recorded herein and the report was finished.

[2] The name "desoxy epinephrine" is proposed because of its relation to epinephrine.

[3] O. Ehrismann, *Deut. med. Wochschr.*, 53 (1927), 1263; through *Chem. Abs.*, 21 (1927), 342.

[4] F. Lasch, *Arch. exptl. Path. Pharmakol.*, 124 (1927), 231.

[5] U. Von Euler and G. L. Liljestrand, *Skand. Arch. Physiol.*, 55 (1929), 1; through *Chem. Abs.*, 23 (1929), 2213.

[6] K. K. Chen and Carl F. Schmidt, *Medicine Monographs*, 17 (1930), 91.

[7] Compare, *e. g.*, "The Comparative Actions of *d*- and *l*-Epinephrine."

the formula assigned to para-hydroxyphenylmethylamino ethanol[1] and details concerning its preparation and properties are meagre.

More recently specimens of salts of para hydroxyphenylmethylamino ethanol and various dosage forms containing it were submitted to the Council on Pharmacy and Chemistry of the American Medical Association for consideration for inclusion in "New and Nonofficial Remedies." As is customary, the aid of the A. M. A. Chemical Laboratory was invoked to examine the product and to elaborate standards of purity and identity. Details concerning the preparation of the compound were not submitted, but it is probable from a consideration of U. S. Patent No. 1,680,055 issued to H. Legerlotz that "desoxy epinephrine" is prepared by reduction of the corresponding ketone.

The product available for examination was furnished by Frederick Stearns and Company, Detroit, Michigan, through the Council on Pharmacy and Chemistry. The sample of "desoxy epinephrine" was a fine, white, odorless, crystalline powder, possessing a bitter taste. It was readily soluble in cold water and alcohol. It melted at 149.5–151° C., corrected (U. S. P. X Method). It was optically inactive. Dr. A. J. Walcott, professor of Mineralogy and Crystallography at Northwestern University, reports that two different crystalline forms are present in unequal proportions.[2]

Chemically, para hydroxyphenylmethylamino ethanol is of interest because of its close relation to epinephrine. As already pointed out the two compounds are

[1] A. Kaufmann (*Ber. d. Chem. Ges.*, 46 (1913), 1826) gives the name homorenon to the same formula as is assigned to paraoxyphenylmethylamino ethanol, but no details concerning it are found in this article. A search through the chemical literature previous to 1913 did not throw light on the subject. Fränkel ("Arzneimittel Synthese," Berlin, 1927, 6th Edition, page 268) carried this formula and name into his textbook. But in another place (*loc. cit.*, page 468) he states: "Homorenon wird Äthylamino-3-4-desoxyacetophenon genannt." Gehes Codex (IV Auflage, 1926, page 429), gives the same formula to Homorenon. Hager's "Handbuch der Pharmazeutischen Praxis," Berlin 1929, page 826, states homorenon "war das Hydrochloride des dioxyphenyl äthylamino, $C_6H_3(OH)_2CH(OH)CH_2NHC_2H_5HCl$)."

[2] "A microscopic examination of oxyphenylmethylaminoethanol reveals two distinct crystalline substances. For convenience these will be referred to as (*a*) and (*b*). There is a much larger per cent of (*a*) than of (*b*). The optical properties of each were found to be as follows:

INDICES OF REFRACTION FOR SODIUM LIGHT.

$\beta = 1.610 \pm 0.002$	$\alpha = 1.500 \pm 0.001$
$\gamma = 1.664 \pm 0.002$	$\beta = 1.554 \pm 0.002$
α not determined	γ not determined
(*a*)	(*b*)
Biaxial	Biaxial
Optically negative	*Optically positive*
Optic angle large	Optic angle small
Birefringence strong	Birefringence strong
Inclined extinction	Parallel extinction

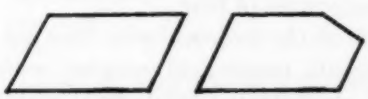

Fig. 1.

Fig. 2.

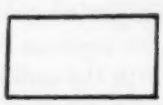

Fig. 3.

"Figures 1 and 2 represent the crystal habits occurring most commonly for (*a*). Figure 3 represents the crystal habit for (*b*) somewhat idealized."

identical in all respects but that the new compound has one hydroxyl less in the nucleus. This would make it less prone to destruction by oxidation. Such appears to be the case at ordinary temperature. However, when the hydrochloride in solid form is exposed to higher temperature but far below the melting point of the hydrochloride, an almost complete decomposition ensues. From drying experiments performed at 100° C., it would appear that the compound is stable until a "nucleus" for decomposition forms, after which decomposition with rapid loss of weight sets in. The following table is illustrative of these remarks.

TABLE I.—LOSS ON HEATING.

		Weight of specimen, Gm.	Time in hours. 6.	12.	24.	48.	72.	96.
Drying at 100° C.	Loss in weight	0.3716	0.0004	0.0004	0.0007*	0.0039	0.0245**	0.0391†
	Loss in per cent		0.10	0.10	0.18	1.04	6.59	10.52
Drying at 120° C.	Loss in weight	0.3662	0.0346††	0.0355	0.0358	0.0362	0.0362	.....
	Loss in per cent		9.44	9.69	9.77	9.88	9.88	.....

* Decomposition begins—specimen turns buff colored.

** Marked decomposition.

† Decomposed completely.

†† The specimen had markedly decomposed.

Loss over phosphorous pentoxide, potassium hydroxide, sulphuric acid and calcium chloride was negligible.

This behavior is somewhat analogous to epinephrine but it is markedly different from phenylamino ethanol sulphate which was found to be stable even after 120 hours at 120° C.[1]

The substance gives typical phenolic reactions with ferric chloride and Millon's reagent. The latter fact may be adduced as evidence of the para position of the hydroxyl group in the benzene nucleus. The color obtained with ferric chloride is different enough to be used for differentiation of para hydroxyphenylmethylamino ethanol and epinephrine. The new compound gives an amethyst-violet color while epinephrine, as is well known, yields a green color.

The qualitative similarity of the new compound is brought out by the application of certain well-known color tests for epinephrine.

It is well known that epinephrine brings about marked color changes when treated with certain agents. A commonly applied color test is that with Folin's phosphotungstic acid reagent.[2] Under proper conditions it is claimed that one part of epinephrine in 3,000,000 of water can be detected by the blue color formed. The reaction with "desoxy epinephrine" under similar conditions is far less sensitive. The intensity of color formation of the two compounds is large enough to serve as a means of qualitative differentiation. Under comparable conditions one-tenth mg. of epinephrine hydrochloride yielded a decided blue color while five mg. of desoxy epinephrine yielded only a faint suggestion of blue.

A dilute aqueous solution (1 per cent) of the hydrochloride does not yield precipitates with the ordinary alkaloidal reagents, tannic acid excepted, which yields a light brown precipitate. In moderately concentrated solutions it yields a yellow

[1] Samuel M. Gordon, *loc. cit.*

[2] O. Folin, W. B. Cannon and W. Denis, *J. Biol. Chem.*, 13 (1912), 480.

crystalline precipitate with platinic chloride (chloroplatinic acid solution). The platinic chloride melts at different temperatures from 123–140° depending on the rate of heating.

Similar to epinephrine but different from ephedrine or phenylamino ethanol salts, the free base is precipitated by ammonia water. Whereas ephedrine can be quantitatively shaken out with ether,[1] and phenylamino ethanol is decomposed in dilute alkali solutions, para-hydroxy-phenyl methylamino ethanol is too insoluble in ordinary organic solvents, such as ether or chloroform, to permit it to be quantitatively shaken out. The free base is apparently slightly soluble in water at room temperature, which vitiates against basing an assay method on this procedure. Several experiments indicated a recovery of about 64 per cent. Theory requires 82.09 per cent. This point was not investigated further, but it may be of some significance in the light of the crystallographic examination already mentioned.

TABLE II.—RECOVERY OF THE FREE BASE.*

Gm. hydrochloride taken	0.3641	0.3663
Gm. base recovered	0.1844	0.1956
Gm. base required by theory	0.2989	0.3008
Per cent of theory recovered	63.0	65.0

* The hydrochloride was transferred to a small beaker and dissolved in 2 cc. of water, 5 cc. of ammonia water were added and the liquid stirred until crystals separated. The beaker and contents were set aside for one hour; the residue filtered through a tared porous crucible and washed with 25 cc. of water, previously saturated with the free base. The residue was dried at 100° C. to constant weight.

The free base melts with decomposition at 184–185° C. The rate of heating is important. If the temperature of the bath is slowly raised, according to the directions in U. S. P. X, the compound begins to decompose at almost 160° and completely decomposes between 168° and 176° C. When the bath is heated at the rate of 5–6° per minute much of the preliminary decomposition is avoided and the compound melts at the higher temperature. The free base isolated assayed for nitrogen by the Kjeldahl method yields the theoretical per cent of nitrogen. From the melting point determinations carried out it would appear more proper to speak of the final decomposition point rather than the melting point.

The hydrochloride is apparently stable in the presence of alkali. When boiled with 10 per cent sodium hydroxide in an apparatus arranged for the recovery of volatile bases, almost all of the standard acid used was recovered on titration.

TABLE III.—RESULTS OF THE QUANTITATIVE DETERMINATIONS.

	Found.	Theory calculated for $HO_6H_4CHOHCH_2NHCH_3.HCl$.
Loss by drying at 100° C. (6 hours)	0.10*	...
Nitrogen (N)	6.89	6.86
Nitrogen in free base	8.32	8.38
Chlorine (Cl^-)	17.57	17.42
Free base	64.0	82.09
Ash	0.09	...

* Figures are reported in terms of percentage.
See Table II.

[1] J. B. Peterson, *Ind. Eng. Chem., loc. cit.;* also New and Nonofficial Remedies, 1930, page 170.

When treated with benzoyl chloride and sodium hydroxide a dibenzoyl compound melting at 176° C. is obtained.

Parahydroxyphenylmethylaminoethanol hydrochloride can be distinguished from the corresponding ketone with Legal's reagent—the ketone yields a green color to the final solution, while desoxy epinephrine remains colorless.

Quantitative determinations showed the hydrochloride to be of a good grade of purity. The results of the quantitative determinations are shown in Table III.

Based in part on the information supplied by the manufacturer and in part on the examination of the specimen of parahydroxy phenyl methylamino ethanol hydrochloride described above, the following standards have been suggested:

Hydroxyphenylmethylaminoethanol Hydrochloride.—Parahydroxyphenylmethylaminoethanol Hydrochloride.—Racemic-α-4-hydroxyphenyl-β-methylamino ethanol hydrochloride.—Racemic-α-hydroxy-β-methylamino-4-hydroxy ethyl benzene hydrochloride.—$HOC_6H_4CHOHCH_2NHCH_3.HCl$.—The hydrochloride of an alkaloid obtained synthetically.

Hydroxyphenylmethylaminoethanol Hydrochloride occurs as fine, odorless, white crystals. It is readily soluble in water and cold alcohol. The aqueous solution is neutral to litmus. It is optically inactive. It melts between 149° and 151° C. with decomposition. (The rate of heating must be strictly according to the method of U. S. P. X.)

Dissolve 0.005 Gm. of hydroxyphenylmethylaminoethanol hydrochloride in 1 cc. of water and add 0.1 cc. of copper sulphate solution followed by 1 cc. of sodium hydroxide solution (20 per cent): a blue-violet color forms at once; the color is not extracted by ether. To 1 cc. of an aqueous solution containing 0.005 Gm. of hydroxyphenylmethylaminoethanol hydrochloride add one drop of mercurous nitrate solution and boil: a blood-red color develops (*distinction from ephedrine and phenylamino ethanol*). To 1 cc. of an aqueous solution containing 0.005 Gm. of hydroxyphenylmethylaminoethanol hydrochloride add one drop of ferric chloride solution (10 per cent): an amethyst-purple color develops (*distinction from phenylaminoethanol, ephedrine and epinephrine*). To 1 cc. of an aqueous solution containing 0.005 Gm. of synephrin, contained in a Nessler tube, add 2 cc. of phosphotungstic acid reagent (*J. Biol. Chem.*, 13 (1912) 477), followed by 10 cc. of sodium carbonate solution (saturated) and dilute to the 50-cc. mark: a faint suggestion of blue color is apparent when viewed longitudinally. At the same time and in the same manner treat 0.1 cc. of 1:1000 (0.0001 Gm.) epinephrine hydrochloride: a decided blue color forms (*distinction from epinephrine*). To 3 cc. of an aqueous solution containing 0.015 Gm. of hydroxyphenylmethylaminoethanol hydrochloride add 1 cc. of alcoholic potassium hydroxide solution followed by 3 drops of chloroform and boil: no odor of carbylamine is observed (*absence of primary amines*). To 0.10 Gm. of hydroxyphenylmethylaminoethanol hydrochloride dissolved in 1.0 cc. of water, add 3 to 5 drops of ammonia water: on rubbing the walls of the container with a glass rod, the free base separates. Filter by suction, wash well with water and dry on a porous plate: the dried base melts with decomposition at 184–185° C. The temperature of the bath must be raised at the rate of from 5 to 6 degrees per minute. To 1 cc. of a solution containing 0.005 Gm. of hydroxyphenylmethylaminoethanol hydrochloride, add 0.1 cc. of diluted nitric acid followed by 0.1 cc. of silver nitrate solution: a white precipitate appears; on boiling, an orange color appears in the liquid.

Dissolve 0.05 Gm. of hydroxyphenylmethylaminoethanol hydrochloride in from 30 to 40 cc. of distilled water, add 1 cc. of diluted hydrochloric acid and 1 cc. of barium chloride solution: no turbidity should result (*absence of sulphate*). Dissolve 0.2 Gm. of hydroxyphenylmethylaminoethanol hydrochloride in 10 cc. of distilled water: the solution yields a negative test for heavy metals when tested according to the U. S. P. X method (see U. S. P. X, page 439). To 1 cc. of a solution containing 0.02 Gm. of hydroxyphenylmethylaminoethanol hydrochloride add 5 drops of a freshly prepared solution of sodium nitroprusside (1 per cent), then 1 cc. of sodium hydroxide solution followed by 10 drops of glacial acetic acid: the final solution is colorless (*absence of corresponding ketone*).

Dissolve about 0.3 Gm. of hydroxyphenylmethylaminoethanol hydrochloride, accurately weighed, in 200 cc. of water; heat to boiling and add 10 cc. of diluted nitric acid followed by sufficient silver nitrate to precipitate all the chloride; allow to stand for six hours; transfer to a tared Gooch crucible; wash well with hot water; then with cold water and dry at 120° C., cool in a desiccator and weigh: the chloride (Cl^-) calculated from the silver chloride weighed is not less than 17.30 nor more than 17.60 per cent. Transfer about 0.35 Gm. of hydroxyphenylmethylaminoethanol hydrochloride, accurately weighed, to a 500-cc. Kjeldahl flask and determine the nitrogen content according to the method described in Medical War Manual No. 6, Laboratory Methods of the U. S. Army, page 221: the percentage of nitrogen corresponds to not less than 6.7 per cent nor more than 7.0 per cent. Incinerate 0.1 Gm. of hydroxyphenylmethylaminoethanol hydrochloride, accurately weighed: the ash is not more than 0.0001 Gm.

A COMPARISON OF THE CHEMICAL AND BIOLOGICAL ASSAYS OF OLEUM CHENOPODII.*

BY WILLIAM F. REINDOLLAR AND JAMES C. MUNCH.

In the lower portion of Carroll County, Maryland, is a narrow strip of land four miles wide and fifteen miles long which is known as the "oil belt" and which produces the greater part of the Oleum Chenopodii, or the American wormseed oil of commerce. Here the plants are grown, harvested and steam-distilled to obtain the volatile oil which occurs mainly in the seed, of which it constitutes three to three and a half per cent. Distillation is carried out during a period ranging from two to six weeks, in October and November depending upon the size of the crop, weather conditions, etc. The oil is distilled with live steam under pressure, allowed to separate from the condensed water, and is drawn off as "normal" oil of wormseed. The product is somewhat soluble in water and this, together with the fact that a portion remains mechanically suspended in the lower liquid, has led, in recent years, to the practice of collecting and redistilling the water. While this second distillation yields a much smaller quantity of oil, this redistilled product has been found to be much richer in ascaridol and of higher specific gravity than the normal oil. It is termed by the growers "high-test" oil of wormseed.

During the autumn of 1929 authentic samples of normal and high-test oil were collected at the stills. These were examined to determine if any relationship exists between the physical constants and/or ascaridol content, and certain pharmacological reactions. The following U. S. P. physical constants were determined:

(*a*) Specific gravity at $\frac{25°}{25°}$ C.
(*b*) Specific rotation.
(*c*) Refractive index at 20° C.
(*d*) Solubility of one volume of oil in 70% alcohol.

Although certain inaccuracies have been shown by Paget (1) to exist in the U. S. P. assay method for ascaridol, and these findings have been confirmed by Nelson (2) and Broughton (3), yet in view of its official character, and present status as an arbiter of quality, it was thought best to adhere to the Pharmacopœial

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* Scientific Section, A. PH. A., Baltimore meeting, 1930.

assay. Ten normal and four high-test oils were examined and the results obtained are given in Table I.

Samples of these oils were tested within a week after collection, and after approximately five months, for their toxicity to gold fish, earth worms, blood worms and porcine ascarides. A measured volume of the oil was triturated in a mortar with talc and a measured volume of water, then filtered. The filtrate was assumed to represent the original concentration although in fact it was somewhat weaker. Measured volumes of this filtrate and of tap water were prepared to give various dilutions which were used for tests. In some experiments the procedure used by Knaffl-Lenz (4) was followed. A measured volume of oil was dissolved in 5 volumes of alcohol and vigorously shaken with water to obtain a cloudy emulsion. This emulsion was then diluted with tap water and tested at once.

In all experiments except on ascarides, the solutions were tested at room temperature. Because of their susceptibility to temperature, these solutions were placed in a series of jars in a tray containing water at 38° C. As a uniform procedure, 50 cc. of solution was allowed for each animal. In most experiments a total volume of 250 cc. was placed in a jar and 5 test animals added. After 15 minutes, 30 minutes, 45 minutes, 1, 2 and 3 hours, and after approximately 24 hours, the number of survivors were noted. The minimum lethal dose was se-

TABLE I.—SAMPLES OF WORMSEED OIL: 1929.

		Specific gravity, 25/25.	Ascaridol, %.	Specific rotation.	Refractive index at 20° C.	Volumes 70 % alcohol in which one vol. oil is soluble.
1	Normal	0.9616	59.8	−6.66°	1.4752	5
2	Normal	0.9593	58.0	−6.38°	1.4750	6
3	Normal	0.9549	50.0	−6.40°	1.4754	9
4	Normal	0.9622	59.9	−7.59°	1.4749	5
5	Normal	0.9715	62.2	−5.84°	1.4747	3
6	Normal	0.9629	66.6	−7.55°	1.4753	4
7	Normal	0.9510	55.8	−8.23°	1.4752	8
8	Normal	0.9748	64.3	−5.54°	1.4744	3
9	Normal	0.9749	72.8	−4.38°	1.4750	3
10	Normal	0.9765	75.6	−5.89°	1.4748	2
11	High-test	0.9883	87.6	−4.08°	1.4739	2
12	High-test	0.9978	99.0	−4.26°	1.4729	2
13	High-test	0.9993	100.0	−3.91°	1.4727	2
14	High-test	0.9959	98.2	−3.57°	1.4740	2

TABLE II.—THE TOXICITY OF OIL OF CHENOPODIUM.

Product no.	Ascaridol content, per cent.	Minimum Lethal Dose—Cc./Liter. Gold-fish.	Earth-worms.	Blood-worms.	Porcine ascarides.
3	50.0	0.67	2.67	0.20	2.5
2	58.0	1.0	2.67	0.10	1.5
1	59.8	1.0	4.0	0.4	...
4	59.9	0.67	6.67	0.13	5.0
5	62.2	1.0	4.0	2.0	Over 5.0
6	66.6	1.0	2.0	0.4	5.0
0	74.9	0.4	4.0	1.0	2.5
11	87.6	2.0	2.5	0.4	2.5
12	99.0	0.67	2.5	0.1	1.5
13	100.0	1.0	2.0	0.1	5.0
Ethyl alcohol	..	20.0	60.0	40.0	175.0

lected as that concentration killing at least three of five animals within three hours. It is recognized that different values for the M. L. D. might be obtained by using a different period of survival. The M. L. D. of this series of oils is given in Table II. Values of ethyl alcohol are given for comparison.

It is evident that these toxicity figures fail to agree among themselves. No lethal doses have been found to agree with chemical analyses for the ascaridol content. Further work is under way in an effort to develop a biological assay which will bear some relationship to ascaridol content. In a similar investigation Knafft-Lenz has also failed to obtain consistent results upon worms, fish or mice which bore any relation to results of chemical assay.

CONCLUSIONS.

1. The Pharmacopœial assay confirms the greater ascaridol content and higher specific gravity reported for "high-test" oil of chenopodium, as compared with "normal" oil.

2. No method of biological assay has been found which agrees with the chemical determination of ascaridol in either normal or high-test oil of chenopodium.

3. Goldfish, earthworms, bloodworms and porcine ascarides differed in susceptibility to different samples of oil of chenopodium of the same ascaridol content.

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THE VOLATILE OIL OF PYCNANTHEMUM MITICANS.*[1]

BY HAROLD W. WERNER.

The plant *Pycnanthemum miticans* (Michx.) Pers. (*Koellia mutica* (Michx.) Britton) is a member of a genus represented in the United States by eighteen species, all of which, excepting *P. californicum* (1), are found east of the Mississippi River ranging from Canada down into Florida.

Like the other members of the genus, *P. miticans* is a perennial herb with opposite leaves and square stems. This species grows to be about 1 meter tall, and is more or less branched. The leaf blades are lanceolate, the floral ones whitened, thus giving the plant an attractive and distinctive appearance. The small white flowers, dotted with magenta, are terminally arranged in dense, conspicuously bracted corymbs.

Although oils produced in two consecutive years were investigated, results were parallel; therefore only the work on the oil of 1928 will be reported here.

The herb from which the oil was produced represents two cuttings made while the plants were in full bloom. The material was dried and the oil extracted by

* From thesis presented in partial fulfilment of the requirements for the Degree of Master of Science in Pharmacy, University of Florida, May 1929.

[1] Scientific Section, A. PH. A., Rapid City, 1929.

steam distillation. 70.41 kilos of dried plant yielded 1102.0 Gm. or 1.57% of dry oil.

The oil was golden-yellow with a somewhat mint-like odor and taste. Its general constants were: 1 cc. soluble in 1.82 cc. of 70% alcohol; $d_{20°}^{20°}$ 0.9250; $a_D^{23°}$ +16.49; $n^{26°}$ 1.4807; acid value negligible; ester value 12.64 (corresponding to 4.47% of $C_{10}H_{19}OH$ calculated as acetate); ester value after acetylation 61.29 (corresponding to 17.90% of $C_{10}H_{19}OH$ in the original oil); per cent ketone with Na_2SO_3 method 71.75.[1]

It should be noted that the ester values are high due, most likely, to the enolization of ketones present in the oil. Under identical conditions pulegone was found to give an ester value of 10.95 which corresponds to 3.87% of an alcohol, $C_{10}H_{20}O$, calculated as acetate. Pulegone after acetylation gave an ester value of 21.0 corresponding to 5.94% of an alcohol, $C_{10}H_{20}O$.

Pulegone.—The presence of pulegone was established by first extracting the ketone from the oil as the sulphite addition compound, using a modification of the normal sulphite assay technique. The ketone was regenerated by treatment with KOH followed by steam distillation. The identity of this material as pulegone is established by a comparison of its properties with those of pulegone (2).

TABLE I.—COMPARISON OF PROPERTIES.

Property.	Regenerated sulphite addition compound.	Pulegone.
Color	Colorless, turning yellowish with age	Colorless, darkening on standing
Odor	Peppermint-like	Peppermint-like
B. p.	223–224°	221–224°
$d_{15°}^{15°}$	0.9405	0.9405
$a_{D23°}$	+23.73°	+20° to +23°
$n_{26°}$	1.4860	At 20°—1.484 to 1.488
M. p. of semicarbazone.	168°	167.5–168°

TABLE II.—DATA FOR FRACTIONS.

No.	Boiling temperature.	$d_{20°}^{19°}$.	$a_{D23°}$.	$n_{D23°}$.	Soly. by vol. in 70 per cent alc.	Per cent by vol. of total oil.
1	Below 56°	0.8863	Too small	1.4529	Mostly soluble 1:25	0.25
2	56–72°	0.8890	+ 4.20°	1.4512	1:2.1	0.84
3	72–75°	0.8967	+13.02°	1.4514	1:2.3	2.33
4	75–80° 77°	0.9027	+18.12°	1.4554	1:2.3	6.39
5	78–81°	0.9117	+21.47°	1.4632	1:2.3	0.98
6	81–89°	0.9204	+18.46°	1.4693	1:2.3	0.75
7	89–110°	0.9265	Too small	1.4813	Mostly soluble 1:60	0.13
8	Residue					0.16

The binitroso compound prepared according to Baeyer and Henrich (3) melted at 84–85°. According to the above authors this compound melts at 81°; however, Miller (1) gives 83–84° while Gordon (4) records 85° (uncorr.)

Acids.—After saponification of the pulegone-free oil, the alkaline hydro-alcoholic portion of the reaction mixture was distilled to free it of most of the alcohol. The still-residue was then made acid with dilute phosphoric acid and

[1] The 1927 oil assayed 62.0% ketone.

steam distilled, the distillate being collected in four fractions. These were treated with $BaCO_3$ and evaporated to a small volume. All four fractions were very low in acid content; however, Fraction 1 reduced $AgNO_3$ as well as $HgCl_2$. This indicates the presence of formic acid. Fraction 2 gave a good ethyl acetate test establishing the presence of acetic acid.

An attempt to identify non-volatile acids in the still-residue was unsuccessful.

Fractionation.—The saponified pulegone-free oil was washed free of alkali, dried with anhydrous Na_2SO_4 and fractionated three times under a pressure of about 1.5 mm.

Menthone.—The odor and properties of Fraction 4 are suggestive of menthone. Its presence in this fraction was established by the preparation of a semicarbazone which melted at 184–185° after recrystallization from alcohol. Wallach (5) gives the melting point of menthone semicarbazone as 184°. Fractions 2 and 3 yielded in smaller amounts semicarbazone melting at 184° and 183–184°, respectively.

Menthone was further characterized by the preparation of a thiosemicarbazone, melting at 158–159°, from Fraction 4. The melting point of menthone thiosemicarbazone is given as 155–157° by Neuberg and Neimann (6).

Beta-Thujone.—From Fraction 5 a small amount of semicarbazone was obtained which melted at 174–175° after recrystallization from alcohol. Gildemeister and Hoffmann (Kremers) (7) record the melting point of beta-thujone semicarbazone as 174–175°. Although this is not believed to be sufficient evidence to definitely establish the presence of thujone, it does show the presence of another ketone which may prove to be beta-thujone.

Alcohols.—From Fraction 5, and in smaller amount from Fraction 6, a phenyl urethane was obtained which after repeated recrystallization from a hydro-alcoholic solvent melted at 108.5°. This and the properties of Fraction 5 indicate the presence of *d*-neo-menthol, the phenyl urethane of which melts at 108° (8). However, the melting point of this compound would also indicate menthol according to the work of Gordon (4) who records the melting point of menthyl phenyl urethane as 108°, and Kremers (9) who gives 108–109° as the melting point of a compound which he states was apparently a menthyl phenyl urethane.

An alpha naphthyl urethane prepared from Fraction 5 melted at 121–122°. The melting point of menthyl alpha naphthyl urethane is given as 119° by Bickel and French (10), as 120° by Gordon (4) and as 124–128° by Neuberg and Hirschberg (11). Zeitschel and Schmidt record the melting point of *d*-neo-menthyl alpha naphthyl urethane as 126° (8). Amount of material precluded further investigation.

Additional Compounds.—In addition to the compounds identified, it is evident from the physical properties of the lower boiling fractions that this oil contains a terpene hydrocarbon; however, the amount of material at hand was too small to attempt its re-solution at this time. The solubility, faint odor, light yellow color, as well as the other physical properties of Fraction 7, also strongly indicate the presence of sesquiterpenes.

SUMMARY.

The dried-above-ground portion of *Pycnanthemum mitticans* yields 1.57% of volatile oil containing menthone, 60 to 75.75% pulegone, menthol or *d*-neo-menthol

and another ketone possibly beta-thujone. Acetic and formic acids are present and the presence of terpenes and sesquiterpenes is indicated.

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THE HYPOGLYCEMIC PROPERTIES OF WHITE SNAKEROOT. (EUPATORIUM URTICAEFOLIUM.)

BY G. F. CARTLAND, F. W. HEYL AND E. F. NEUPERT.

It is now well established that the ingestion of white snakeroot by cattle leads to a condition known as trembles and that the use of milk from such cattle may cause milk sickness in man. A historical review of this subject is given in an article by Couch (1) who, as a result of animal experiments, has concluded that the toxic constituent of white snakeroot responsible for trembles is an unsaturated alcohol, tremetol.

That white snakeroot may contain one or more principles which affect the blood sugar is indicated by the fact that both a hyperglycemia and hypoglycemia have been reported in cases of poisoning with this plant. Couch (1) observed that in sheep poisoned with tremetol the blood sugar was markedly increased. On the other hand, Bulger, Smith and Steinmeyer (2) observed the development of hypoglycemia, even to the extent of convulsions and death in rabbits poisoned with white snakeroot. The experiments of these authors indicate a close relationship between the hypoglycemia and the toxic factor inasmuch as a lowered blood sugar was observed only in those animals which were obviously sick. The oral administration of dextrose produced marked improvement in most cases. Bulger, Smith and Steinmeyer regard hypoglycemia as an important symptom of white snakeroot poisoning and suggest the use of a high carbohydrate diet for treatment. These authors interpret the results of their preliminary experiments as indicating that such studies present a new field for the investigation of ketosis and of carbohydrate and fat metabolism. A tea prepared from white snakeroot has been used in some parts of the country for the treatment of diabetes under the belief that this plant contains an "insulin-like" substance.

The experiments here reported were conducted to investigate the "insulin-like" properties of white snakeroot with the object of finding out whether the changes in blood sugar following the oral administration of this plant are due to

a specific action upon sugar metabolism, or whether these changes may be merely secondary as a result of injury to the liver or kidney of the poisoned animal. Very early in this work it became apparent that the dried plant lacks the toxic constituents which are responsible for milk sickness and for the severe poisoning associated with the ingestion of the green plant. Similarly, the dried plant apparently lacks the principle responsible for the severe hypoglycemia noted by Bulger, Smith and Steinmeyer. Consequently our experiments agree with those of these authors in indicating a close relationship between the toxic and hypoglycemia factors since both are apparently destroyed by drying.

However, aside from the severe hypoglycemia sometimes associated with poisoning by the green plant, our experiments with extracts of the dried plant indicate the presence of a hypoglycemic substance which, although slight and irregular in its action upon the blood sugar of fasting dogs, was, nevertheless, deemed of sufficient importance to warrant further study. Further experiments concerned with the effects of oral administration of white snakeroot upon alimentary hyperglycemia indicated that the mildly hypoglycemic action of the extracts is exerted without toxic effects upon the liver or kidney. Attempts at isolation of an active fraction were unsuccessful. We obtained no fraction of greater activity than the entire 70 per cent alcoholic extract of the dried plant.

EXPERIMENTAL.

The white snakeroot used in these experiments was collected from a "milk-sick" area during September 1929. The entire part of the plant growing above the ground was air dried and ground for extraction.

(*A*) *Effect of Alcoholic Extract upon the Fasting Blood Sugar.*—The dried plant was exhausted by percolation with 70 per cent alcohol. Immediately before use the alcohol was removed by distillation *in vacuo* below 60° and the residual emulsion made up to a volume such that 1 Gm. of dried drug is represented in 5 cc. of extract. This emulsion, called "Extract A" was administered by stomach tube to dogs in doses representing 5 to 20 Gm. of white snakeroot. The dogs were starved for 16 hours previous to the experiment and were allowed no food or water during the period in which the blood sugar was followed. Control experiments were performed using equivalent amounts of water substituted for the snakeroot extract. The results, summarized in Table I, are irregular but in two of the three cases in which the largest dose was administered a mild hypoglycemia was observed after 3 to 5 hours.

Although the doses of white snakeroot administered were as large as could be retained by the dogs without emesis, no toxic effects other than slight nausea were observed. This absence of toxicity together with the very mild lowering of the fasting blood sugar observed in our experiments indicate that our extracts do not contain appreciable quantities of the principle which causes the severe poisoning and marked hypoglycemia reported by Bulger (2).

Since these experiments established the absence in the dried snakeroot of a powerful hypoglycemic substance capable of reducing the fasting blood sugar when administered orally, we continued our experiments to see if there might be present a mildly hypoglycemic principle capable of reducing alimentary hyperglycemia. Since the slight hypoglycemia observed in the early experiments oc-

curred 3 to 5 hours after administration of the extract, a latent period of $4^1/_2$ hours was allowed between the administration of the white snakeroot and the glucose in the following experiments.

(*B*) *Effects of White Snakeroot upon Alimentary Hyperglycemia.*—As in the above experiments the dogs were starved for 16 hours. After taking the initial blood sample, the white snakeroot was administered in the form of Extract A by stomach tube. After a period of $4^1/_2$ hours a second blood sample was taken and immediately afterward a dose of glucose calculated according to body weight was administered orally, dissolved in 100 cc. of water. Blood samples were taken first at one-half hour intervals and later at hourly intervals and analyzed for sugars by the Shaffer-Hartmann (3) method, amino acid nitrogen by the method of Folin (4), and urea nitrogen by the method of Koch (5). Blood amino acid and urea nitrogens were followed as an index of liver and kidney damage. Red cell counts were made for the purpose of detecting changes in blood volume. No food or water was allowed during the course of the experiment. Control experiments were performed upon the same dogs using exactly the same procedure except that an equal volume of water was substituted for the extract of white snakeroot. In order to remove as far as possible variations in glucose tolerance due to variations in diet, the dogs were fed upon a diet of milk and whole-wheat bread for several days preceding and during the entire time in which the dogs were under active experimentation. In spite of these precautions, a considerable variation was observed in the hyperglycemia produced in different dogs and in the same dog at different times following the oral administration of constant amounts of glucose. The experiments are listed in Table II in series arranged in the order of their performance. Each series represents one or more experiments with white snakeroot extract paralleled by a control experiment upon the same dog. Thus, each series is considered as a unit in judging the power of the extract of white snakeroot to depress the hyperglycemia curve following the oral administration of glucose.

The results, summarized in Table II, show that white snakeroot administered $4^1/_2$ hours before the administration of glucose exerts a depressant action upon the alimentary hyperglycemia. In each of the four series of experiments the maximum rise in blood sugar following the oral administration of glucose is reduced by the previous administration of white snakeroot in the form of Extract A, as compared to the corresponding controls. The degree of this reduction shows considerable variation with equivalent doses of Extract A and apparently is not increased by increasing the dose of white snakeroot from 10 Gm. to 20 Gm. In those cases where the hypoglycemic action of white snakeroot is most pronounced, not only a lowering of the maximum blood sugar is observed but also a quicker return to normal.

The changes in amino acid and urea nitrogens of the blood are insignificant indicating the absence of any toxic action upon liver or kidney. The determination of urinary sugar during and immediately following the experiments failed to indicate any increase in sugar excretion, which also shows that the hypoglycemic action is not due to a lowered renal threshold. The red cell counts fail to indicate changes in blood volume of any significance. No toxic effects were observed as a result of the administration of the extracts except a temporary nausea with the larger doses. Doses equivalent to 20 Gm. of the dried plant were retained with-

out emesis by distracting the dog's attention at the earliest appearance of symptoms of nausea. In spite of repeated experiments upon the same animal, none of the animals showed the toxic symptoms of lipemia, acidosis and acetonuria characteristic of severe poisoning with white snakeroot. These results indicate that the dried white snakeroot contains one or more principles which administered by mouth exert a hypoglycemic action independent of any toxic effects upon the liver or kidney.

(*C*) *Attempts at Fractionation with the Purpose of Concentrating the Hypoglycemic Activity.*—The dried plant was treated by the method of Bourquelot (6) for the detection of glucosides. The plant tissue was exhausted with boiling 95 per cent alcohol in the presence of calcium carbonate. The combined alcoholic extracts were concentrated to dryness *in vacuo*. The glucoside fraction is the water-soluble part of the residue obtained from the alcoholic extracts. The water-insoluble material is the resin fraction. Although considerable inulin and levulose were found in the glucoside fraction, no glucoside capable of being split by emulsin was present. Couch (1) reports the presence of a non-toxic glucoside in the plant. Jordan, Whelan and Gidley (8) on the other hand report that the dried plant contains no glucoside. It may be that in their material as well as in ours the glucoside found by Couch to be present in the green plant was destroyed during the drying process. Although our 70 per cent alcoholic extract (Extract A) was concentrated *in vacuo* and that of Jordan *et al.* was evaporated on the water-bath, our extract apparently is no more toxic to dogs than Jordan's extract was to rabbits. Both the glucoside fraction and the resin fraction were tested for hypoglycemic activity using the same type of experiment described above. The results, reported in Table III, indicate that both of these fractions are inactive.

Attempts to fractionate Extract A, which was used in the experiments listed in Table II, resulted only in the loss of the hypoglycemic activity. Extract A was separated by centrifugation into water-soluble and water-insoluble fractions, both of which were tested on the dogs for their ability to reduce alimentary hyperglycemia. The results, summarized in Table III, are negative. The entire Extract A, however, shows its original activity.

It was thought that possibly the hypoglycemic activity may be due to myrtillin or some similar substance in white snakeroot. The "myrtillin fraction" was pre-

TABLE I.—EFFECT OF WHITE SNAKEROOT UPON THE BLOOD SUGAR OF FASTING DOGS.

Dose of dried* plant administered as Extract A. *Gm.*	Sugar per 100 cc. Blood. Initial *Mg.*	1 hr. *Mg.*	3 hrs. *Mg.*	5 hrs. *Mg.*	7 hrs. *Mg.*
0 (control)	101			95	
5	89		89	92	
10	98		92	91	89
0 (control)	92	95	86	87	89
20	90	93	92	87	
20	90		71	63	70
20	92			77	84
0 (control)	91	92	91	84	87

*Administered orally immediately following the initial blood sample.

pared from the plant using the procedure of Allen (7), which consists of extracting the plant with hot, acidulated, 50 per cent alcohol, precipitation of the protein with the addition of more alcohol, and precipitation of the filtrate with ammonium sulphate. The ammonium sulphate precipitate from 100 Gm. of dried white snakeroot weighed 2.7 Gm. This is called the myrtillin fraction since it corresponds

TABLE II.—EFFECT OF THE ORAL ADMINISTRATION OF WHITE SNAKEROOT UPON ALIMENTARY HYPERGLYCEMIA IN THE DOG.

Series no.	Dose of dried plant administered as Extract A.*	Dose of glucose per Kg.**		Blood Analyses. Initial	4½ hrs.	5 hrs.	5½ hrs.	6½ hrs.	8½ hrs.	24 hrs.	Maximum rise, blood sugar.
	Gm.	*Gm.*		*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*
1	20	3	Sugar	90	90	111	100	100	90		21
	10	3	Sugar	100	89	106	104	99	83		17
	0	3	Sugar	100	95	129	120	121	95		34
2	10	3	Sugar	88	77	140	116	114	109	81	63
			Urea N	12.1	10.5	10.2	10.3	10.0	10.4	12.1	
			Amino N	7.4	7.1	6.7	6.1	5.5	5.5	7.5	
			R B C	5.3	6.3	5.9	5.6	5.5	5.4	6.4	
	0	3	Sugar	86	80	154	102	129	86	81	74
			Urea N		10.6	11.1	11.0	10.9	10.7	9.0	
			Amino N	7.1	5.0	5.6	5.4	4.8	4.7	6.7	
			R B C	6.7	5.5	6.0	5.8	6.3	6.0	6.5	
3	10	2	Sugar	83	77	96	98	80	87	83	21
			Urea N		8.3	8.3	7.4	7.5	9.8	9.2	
			Amino N	8.0	8.3	7.7	7.5	7.3	7.3	7.2	
			R B C	6.3	6.3	6.2	6.2	5.9	6.0	6.4	
	0	2	Sugar	81	82	111	114	78	76	74	32
			Urea N	7.0	7.8	7.1	6.6	6.6	7.2	6.9	
			Amino N	8.9	7.2	7.0	6.3	6.5	7.0	8.0	
			R B C	6.6	6.0	5.7	5.8	6.0	0.1	6.6	
4	10	2	Sugar	87	82	138	127	105	69	76	56
			Urea N	8.0	7.2	8.2	7.1	7.5	8.1	10.9	
			Amino N	6.5	6.9	6.5	5.5	5.5	5.5	6.7	
			R B C	6.4	5.7	5.7	5.6	6.0	5.4	6.5	
	0	2	Sugar	77	79	150	118	140	65	74	71
			Urea N	9.3	10.1	10.2	11.3	11.6	10.9	13.3	
			Amino N	7.2	6.6	6.7	5.8	5.6	5.5	6.5	
			R B C	6.6	5.6	6.0	5.0	5.0	5.5	6.0	
	10	2	Sugar	90	81	104	102	102	70	75	23
			Urea N	7.8	7.5	7.7	9.0	8.8	8.4	11.7	
			Amino N	6.9	7.0	6.5	5.9	5.5	5.6	6.6	
			R B C	6.4	5.2	5.9	6.5	5.6	5.7	6.2	

* Administered immediately after taking the initial blood sample.

** Administered immediately after taking the 4½-hour blood sample.

to a similar fraction of that name obtained by Allen from the myrtle and other plants. The entire precipitate from 100 Gm. of dried plant was administered in a single dose to a dog. Although this dose represents 5 to 10 times the amount of white snakeroot which was found active in the form of Extract A, the results, summarized in Table III, are negative. The hypoglycemic principle in white

snakeroot is probably not myrtillin. However, the hypoglycemic action of dried white snakeroot resembles that of myrtillin in that it apparently is demonstrated on the alimentary hyperglycemia curve (Table II) but to a much less extent upon the fasting blood sugar (Table I).

TABLE III.—FRACTIONS OF WHITE SNAKEROOT TESTED FOR THEIR ACTION UPON ALIMENTARY HYPERGLYCEMIA† IN THE DOG.

Fraction.	Dried plant represented in dose administered.*	Sugar per 100 cc. Blood. Initial	4½ hrs.	5 hrs.	5½ hrs.	6½ hrs.	7½ hrs.	Maximum rise in blood sugar.
	Gm.	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*	*Mg.*
Series 1.								
Glucoside fraction	30	82	79	140	130	116	68	61
Extract A	20	85	80	115	122	104	71	42
Water insol. fraction of Extract A	20	85	88	164	135	95	73	76
Extract A	20	85	82	126	110	90	79	44
Control	0	81	75	149	152	132		77
Series 2.								
Resin fraction	30	76	78	141	103	82	67	63
Water-sol. fract. of Extract A	20	85	78	133	90	71		55
Water-sol. fract. of Extract A	20	83	84	144	108	94	68	60
Control	0	81	87	150	118	64	87	63
Series 3.								
Myrtillin fraction	100	85	84	127	128	109		43
Control	0	85	88	137	135	101		49

* White snakeroot extracts administered immediately after taking the initial blood sample.

† Two grams of glucose per Kg. administered immediately after taking the 4½-hour blood sample.

SUMMARY AND CONCLUSIONS.

White snakeroot contains a principle which administered by mouth exerts a mildly hypoglycemic effect upon alimentary hyperglycemia in dogs. This principle resists drying, is without toxic action upon the liver or kidney, and is apparently not related to the factor or factors concerned in the production of trembles and milk sickness. Attempts at fractionation yielded no fraction of greater hypoglycemic activity than the entire 70 per cent alcoholic extract (Extract A). The hypoglycemic activity of dried white snakeroot is not of sufficient magnitude or regularity to warrant its use in the treatment of diabetes.

The authors wish to thank Dr. J. B. Ewing of Spruce Pine, N. C., for supplying the white snakeroot used in these experiments.

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KALAMAZOO, MICHIGAN.

DETERMINATION OF OIL AND ALKALOIDS IN DELPHINIUM SEED.

BY L. N. MARKWOOD.*

Previous researches on Delphinium seed, conducted by the writer,[1,2] made it desirable to determine the alkaloid content of the seed. The usual (Keller) process[3] when applied to this type of seed was found objectionable as, on account of the high oil content, intractable emulsions were found. The procedure here described was developed especially for seed of high oil content and makes possible a clean separation of the oil and alkaloids.

A mixture of several alkaloids is present in Delphinium seed. These alkaloids are soluble in most of the usual organic solvents, especially chloroform, but not in petroleum ether. Owing to their solubility in the oil of the seed, however, a petroleum ether extract of the seed contains some alkaloids. Ammonia liberates only part of the alkaloids from acid solution, but sodium hydroxide effects complete liberation. Alkaline solutions yield the alkaloids readily to chloroform, but acid solutions are not so rapid in their extraction of the alkaloids from chloroform. Sulphuric acid is the best medium for extracting the alkaloids from an organic solvent, and in this work 5% acid (by weight) was adopted as this strength accomplishes quicker extraction than weaker strengths without harmfully affecting the alkaloids. The alkaloids are partially extracted from chloroform by pure water.

PROCEDURE.

Extract 10 Gm. of the well-ground seed (ground as fine as the oily nature will permit) by percolation with low boiling petroleum ether until the oil is apparently all removed. Dry the marc. Extract the petroleum ether solution, concentrated if necessary to about 100 cc., with 5% sulphuric acid until the alkaloids are completely removed. Five extractions of 15 cc. each usually suffice. The last acid extract should give not more than a faint turbidity with Wagner's reagent (iodine in potassium iodide solution), the test being made on approximately 5 cc. of solution. If a precipitate forms, dissolve it by dilute sodium thiosulphate, return to the main solution and continue the extraction.

Filter the petroleum ether extract through paper into a weighed beaker, wash paper and funnel well with the solvent, and evaporate on the steam-bath. If the oil residue is not clear, dissolve it in petroleum ether, filter, wash as before and evaporate again. To insure complete removal of the solvent, which is tenaciously retained by the oil, add a little ethyl alcohol and thoroughly heat on the

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* 1001—15th St., Washington, D. C. This work was performed in the U. S. Department of Agriculture.

[1] "The Isolation and Properties of the Alkaloids and Oil of Larkspur Seed (*D. consolida*)," JOUR. A. PH. A., 13 (1924), 696–702.

[2] "Isolation of the Alkaloids and Oil of Stavesacre Seed," JOUR. A. PH. A., 16 (1927), 928–932.

[3] Allen's Commercial Organic Analysis, 4th Edition, Vol. VI, page 179.

steam-bath. Weigh the beaker with contents and from the weight thus obtained calculate the percentage of oil in the seed.

Make the combined acid extracts of the alkaloids distinctly alkaline with 15% sodium hydroxide solution and extract with chloroform, 3 portions of 15 cc. each, or until the aqueous layer gives a negative test for alkaloids. (The test with Wagner's reagent is made in slightly acid solution.) Make the combined chloroform extracts up to exactly 100 cc. and pour over the previously obtained marc in a stoppered flask. After several minutes add 5 cc. of *N* sodium hydroxide solution and shake the flask at frequent intervals for two hours. Filter the contents in a 4-inch Büchner funnel (using a rapid paper), catching the liquid in a suitable vessel such as a calibrated graduate. To avoid evaporation cover the funnel with a watch glass, and do not use suction. Collect as large an aliquot as possible, which will usually be 75 cc.

Extract the chloroform solution repeatedly with 5% sulphuric acid until the last extract fails to give a positive test for alkaloids. Six extractions of 15 cc. each are usually sufficient. Make the aqueous solution distinctly alkaline with sodium hydroxide and extract with chloroform, 3 portions of 15 cc. each, or until the alkaloids are completely removed. For further purification, which is usually necessary and is indicated by the yellow color in the chloroform solution, extract the latter with 5% sulphuric acid as before, again make it alkaline and extract with chloroform. Wash the chloroform solution once with 5–10 cc. of slightly alkaline water and filter through paper into a weighed beaker, washing the separator and funnel well with the solvent. Evaporate the chloroform by means of an air current and moderate heat, add a few cubic centimeters of alcohol, and again evaporate. Warm the beaker a few minutes in the oven (100° C.), cool in a desiccator and weigh. From the weight of the residue calculate the percentage of alkaloids in the seed.

A sample of *D. consolida* and one of *D. staphisagria* were analyzed by this method, with the following results:

D. consolida.		*D. staphisagria.*	
Oil, per cent.	Alkaloids, per cent.	Oil, per cent.	Alkaloids, per cent.
28.3	1.06	34.9	1.30
28.7	1.01	34.7	1.35
28.6	....	35.2	1.22
28.7	....	35.4	1.27

CHEMICAL EXAMINATION OF "PYRIDIUM" AND "MALLOPHENE."

(BRANDS OF PHENYLAZO-ALPHA-ALPHA-DIAMINOPYRIDINE HYDROCHLORIDE.)

BY GEORGE W. COLLINS, PH.C., SC.D.*

Pyridium and Mallophene are proprietary names for two genito-urinary antiseptics recently introduced to the medical profession. The former is marketed by Merck & Co., Inc., Rahway, N. J.; the latter by the Mallinckrodt Chemical Works, St. Louis, Mo. Both Pyridium and Mallophene belong to the azo group

* A contribution from the American Medical Association Chemical Laboratory.

of dyes. Azo dyes have been used in medicine for many years, including such well-known therapeutic agents as the "Scarlet R compounds."

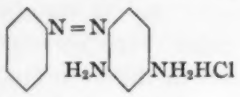
Pyridium, it is stated, was originated by Professor Iwan I. Ostromislensky,[1] who since then has come to America from Russia to give this country the benefit of his researches.[2]

Pyridium was presented to the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies.[3] It was in this connection that the Chemical Laboratory was asked to investigate its chemical composition.

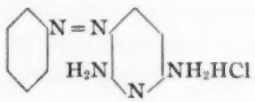
According to the presentation,[4] the product is: "phenylazo-alpha-alpha-diaminopyridine hydrochloride," $C_6H_5N:NC_5H_2N(NH_2)_2HCl$. It is prepared by[5] coupling benzenediazonium chloride with alpha-alpha-diaminopyridine in hydrochloric acid solution and subsequent crystallization from water.

Tchitchibabin and Zeide[6] in their work on compounds containing the pyridine nucleus apparently were the first to prepare the base of this azo dye. The base was described by them as being of an orange-red color and as appearing to have the formula $C_6H_5N:NC_5H_2N(NH_2)_2$, the positions of the amino (NH_2) groups being the same as in Chrysoidine, $C_6H_5N:NC_6H_4(NH_2)_2$.

A comparison of the structural formulas of diaminoazobenzene hydrochloride (Chrysoidine), which at one time was used in the treatment of trypanosomiasis and phenylazo-alpha-alpha-diaminopyridine hydrochloride (Pyridium), illustrates their similarity and conversely their chemical differences.



Chrysoidine



Pyridium

It will be noted that Pyridium differs from Chrysoidine in that it contains a pyridine nucleus instead of a benzene, hence the compound contains five nitrogen atoms in place of four.

SPECIMENS EXAMINED.

The specimens subjected to investigation were: *a.*—A specimen of Pyridium, presented by Merck & Co., Inc., in 1928, which was examined crystallographically;

[1] Iwan I. Ostromislensky, "The Scientific Basis of Chemotherapy," Part I.

[2] Recently Professor Ostromislensky has sponsored to the medical profession another new genito-urinary antiseptic, Serenium-Squibb, which is claimed to be ethoxy-diaminoazobenzene hydrochloride. [Q. & M. Notes, *J. A. M. A.*, 94 (May 31, 1930), 1783.]

[3] Generally abbreviated "N. N. R." A volume published annually by the Council on Pharmacy and Chemistry of the American Medical Association. It describes new remedies of merit which are not official in the United States Pharmacopœia.

[4] Pyridium was first presented about March 1, 1928, by Merck & Co., Inc., distributor, and it was stated that "Pyridium is composed of the monohydrochlorides of Beta- and Gamma-phenylazo-alpha-alpha-diaminopyridine, $C_6H_5N:NC_5H_2N(NH_2)_2HCl$." Some months later the Rare Chemicals, Inc., 100 Fifth Avenue, New York, N. Y., introduced Azamine to the dental trade, claiming it was a colloidal condensation product of the beta and gamma isomers of phenyl-azo-alpha-alpha-diaminopyridine hydrochlorides (Pyridium) especially adapted for dental use.

[5] Manufactured by the Pyridium Corporation of New York (Merck & Co., Inc., distributor), U. S. patents 1,680,108 and 1,680,109.

[6] *J. Russ. Phys.-Chem. Soc.*, 46 (1914), 1216–1236.

b.—Specimens of Pyridium[1] received from the distributor about two years later, on which this chemical examination was based; *c.*—Specimens of Mallophene[2] purchased on the open market. Mallophene was introduced while this investigation was under way. According to the label, it is manufactured by "Roosevelt Chemical Co., Inc." and distributed by the Mallinckrodt Chemical Works. Due to the similarity in the claims and in the origin of the product,[3] it was deemed advisable to include it in this study to determine whether or not it was identical with Pyridium.

CRYSTALLOGRAPHIC PROPERTIES.

Specimens of the products were investigated as to their crystalline character to ascertain, first, their status as definite chemical entities or mixtures and, second, the comparative values of the different brands. The collaboration of Dr. Albert J. Walcott, Professor of Mineralogy and Crystallography, Northwestern University, was obtained. Portions of the two different specimens of Pyridium and the one of Mallophene were subjected to crystallographic examination. Dr. Walcott reported as follows:

CRYSTALLOGRAPHIC PROPERTIES OF PYRIDIUM AND MALLOPHENE.

First Specimen (*Report Made June 10, 1928*).—Pyridium is a crystalline substance showing double refraction. The crystal fragments are very small and irregular in form. The slides examined did not show any well-formed crystals.

A very striking optical property is that of *pronounced pleochroism*, showing yellow, brownish red and opaque absorption characteristics.

Since there were no well-defined crystals or cleavage fragments, indices of refraction were determined only approximately:

One index of refraction was found to be higher than 1.740 and lower than 1.770.

One index was higher than 1.610 and lower than 1.640.

No limits were obtained for a third index because the absorption for that position was so strong that the crystal fragment was opaque.

Second Specimen (*Report Made February 12, 1930*).—This specimen is of a somewhat different character than the specimen of two years ago. The crystal fragments are slightly larger. They appear to be "*cleaner*" and more sharply defined. There is a marked difference in the per cent of an "impurity" or a second entity. In the specimen submitted two years ago there was present an appreciable amount of well-defined crystal fragments of a second entity. Such fragments are practically absent from the new sample. In ten slides, only two showed a couple fragments of this nature, while several fragments were always to be found in any slide made of the old sample. From my examination I would say that the second specimen of Pyridium is of purer quality than the first.

Mallophene.—The specimen of Mallophene is largely composed of a very fine crystalline powder, too fine to determine quantitatively any optical properties. This fine crystalline powder shows *double refraction* and also *pleochroism*. It is brownish red in color.

Mixed with this powder are well-defined crystal fragments, a second entity, of a substance which shows a very strong double refraction, is biaxial, optically positive, and has a small optical

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[1] The labels of the containers of the product bore the same control numbers, hence they were pooled and used as specimen for analysis.

[2] Mallophene [Q. & M. Notes, *J. A. M. A.*, 93 (Dec. 28, 1929), 2044] was stated to be phenylazo-alpha-alpha-diaminopyridine hydrochloride. The product does not stand accepted by the Council on Pharmacy and Chemistry. It is *not* the policy of the Council on Pharmacy and Chemistry to recognize a second proprietary name for identically the same substance.

[3] The containers of Mallophene bore the same control numbers on the trade labels, hence they were pooled and used as a sample for analysis in this investigation.

axial angle. It shows a dispersion of optic axis, red > violet, and shows pleochroism. $\beta = 1.600 \pm 0.002$.

There is also present an appreciable per cent of irregular fragments which are isotropic in character.

CHEMICAL EXAMINATION.

The specimens of Merck & Co., Inc., were labeled Pyridium-Phenylazo-Alpha-Alpha-Diamino-Pyridine Hydrochlorides and those of the Mallinckrodt Chemical Works were designated as Mallophene[2]-Phenylazo-alpha-alpha-diamino-pyridine hydrochloride.

The color and appearance of the two products differed slightly: the Mallinckrodt specimen was a medium red, fine, microcrystalline powder; the Merck product was a dark red-violet but appeared to be a slightly coarser powder than Mallophene. Both specimens were odorless and possessed a slightly bitter taste. The solubilities of the products (1 Gm. in 250 cc. of water) differed somewhat; both were red in color. The solution of the Mallinckrodt product contained a very slight residue of floating particles (suggestive of filter fibre), while that of the Merck specimen was faintly turbid. The reaction of the aqueous solutions appeared to be neutral to litmus and congo paper but, as was expected, both products were distinctly acid when determined by the electrometric method. When subjected to thermal analysis, the Mallinckrodt specimen was found to melt at 233° to 234° C., with decomposition, while that of Merck & Co. melted at 237° to 238° C., also with decomposition, and a mixture of the two appeared to melt at 232° C., with decomposition.

SOME CHEMICAL REACTIONS.

On digesting the specimens with diluted hydrochloric acid, small, dark red crystals or scales separated in both instances; on decanting the supernatant liquid, followed by the addition of water to the crystalline precipitate, the compound formed dissolved. This very likely was due to the formation of an unstable dihydrochloride; in these respects, the products of the two firms appeared to be similar.

On neutralizing aqueous solutions of the respective products with diluted ammonia, there resulted a brownish yellow, crystalline precipitate, which was subsequently recrystallized from water. The crystals obtained from the Mallinckrodt product melted at 136° to 137° C., while those from the Merck specimen melted at 138° to 139° C.; a mixture of the two melted at 136.5° to 137° C., which indicated that the crystalline substances were identical; these substances, according to the literature,[1] appear to be the free base, phenylazo-alpha-alpha-diaminopyridine, which melts at 137° to 138° C.

Upon reducing the compounds with zinc dust and diluted hydrochloric acid, aniline[2] was identified as one of the components of each of the products examined. This behavior is characteristic of diaminoazobenzene as well, the hydrochloride of which is known commercially as "Chrysoidine."

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[1] *Apoth.-Ztg.*, 44 (Nr. 17, 1929), 254.

[2] Tchitchibabin and Zeide, *J. Russ. Phys.-Chem. Soc.*, 46 (1914), 1216–1236, expected the base, phenylazo-α-α-diaminopyridine, upon reduction to yield aniline and triaminopyridine, α-α-β-$C_5H_2N(NH_2)_3$.

TABLE I.—LOSS ON DRYING.

Brand.	Method employed.[1]	Intervals of Drying and Weighing. 6 hrs.	24 hrs.	96 hrs.	216 hrs.	332 hrs.	572 hrs.
Mallophene	Sulphuric acid	0.41[2]	0.53	0.69		Constant	
	100° C.	1.08	1.42	1.57	1.64	1.76	1.96
Pyridium	Sulphuric acid	0.04	0.21			Constant	
	100° C.	0.11	0.18	0.26	0.29	0.45	0.65

[1] Specimens were exposed over sulphuric acid in a partially exhausted desiccator and in an electric oven at 100° C.

[2] Figures are reported in terms of percentages.

Moisture determinations carried on over a period of hours indicated that the two products differ a little. The specimens exposed over sulphuric acid in a desiccator with a partial vacuum obtained constant weight in a relatively short period of time, while those that were dried in an electric oven at 100° C., gradually lost weight. The Mallinckrodt specimen yielded the greater loss (see Table I).

The p_H curves of the electrometric titrations[1] were interesting. They were performed (*a*) on the undried substance, (*b*) on the specimens that had been exposed over sulphuric acid in a desiccator with a partial vacuum and (*c*) on specimens that had been previously dried in an electric oven at 100° C. for 572 hours. All curves of the titration with tenth-normal sodium hydroxide solution were found to be characteristic of an acidic substance, possessing only one sudden rise or break.[2] In the case of the undried specimens this break corresponded to an amount of hydrogen chloride less than the stoichiometrical amount for a dihydrochloride but slightly more than the amount necessary for a monohydrochloride. The curves on the dried material, whether it was dried in a partial vacuum over sulphuric acid or in an oven at 100° C., showed a sudden rise or break that corresponded stoichiometrically to that given by a monohydrochloride. It appears that the products were monohydrochlorides containing only slight amounts of uncombined hydrogen chloride. The Mallinckrodt product contained a small excess of hydrogen chloride.

The results of the quantitative determinations are recorded in Table II.

[1] The usual hydrogen electrode and calomel cell were used in these determinations.

[2] Our attention was called by Merck & Co., Inc., to an unpublished report on Pyridium prepared by a consulting chemist, who states that Pyridium would be reduced by hydrogen when a hydrogen electrode was placed in its solution and, therefore, that the electrometric titration "was scientifically precluded." The determinations made by me previous to this information show that the titration was not "scientifically precluded." Close checks were obtained on the specimens, which agreed well with theory, with the figures calculated from the chloride (Cl^-) determinations and with the colorimetric titrations (for comparative figures see Table II). The latter is not as "clean-cut" as the electrometric, due obviously to difficulty of a sharp color end-point.

The purpose of determining the hydrogen chloride after drying was to see whether or not the substance loses the hydrogen chloride easily. In case of acriflavine hydrochloride [G. W. Collins and A. Stasiak, "Comparative Chemical Examination of Different Brands of Acriflavine Hydrochloride (Acriflavine) and Acriflavine Base ('Neutral' Acriflavine)," JOUR. A. PH. A., 18, 659, No. 7, July 1929], it was found that practically all the hydrogen chloride could be removed by "drying" at 100° C.

TABLE II.—COMPARATIVE ANALYSES.

	Theory.[1]	Per Cent Found by A. M. A. Laboratory.[2] Mallophene.	Pyridium.
Loss over sulphuric acid		0.53	0.21
Loss at 100° C.		1.46	0.21
Water-insoluble material		0.20	0.14
Ash		0.27	0.08
Nitrogen (N^{---})	28.05	28.55	29.31
Chlorine (Cl^-)	14.20	14.96	14.18
Base,[3] $C_6H_5N:NC_5H_2N(NH_2)_2$	85.37	80.88	83.05
Hydrogen chloride (HCl)			
1. By calculation from chlorine (Cl^-)	14.61	15.38	14.58
2. By precipitation and subsequent titration of the filtrate[4]		15.47	14.92
3. Electrometric titrations			
(*a*) Undried specimen		15.45	14.84
(*b*) Specimen previously dried over sulphuric acid		14.74	14.50
(*c*) Specimen previously dried at 100° C.		14.38	14.49

[1] Calculated on anhydrous basis.

[2] All figures, except moisture or otherwise indicated are calculated to the dried basis.

[3] The base, phenylazo-alpha-alpha-diaminopyridine, was determined as follows: A weighed quantity (0.13 Gm.) of each of the specimens was transferred to a 250-cc. beaker and dissolved in 50 cc. of luke-warm water; with constant stirring, an excess of ammonia water was added; the beaker and contents cooled to about 0° C., and allowed to remain at that temperature for about one hour. The precipitate of the base, phenylazo-alpha-alpha-diaminopyridine, was collected on a Gooch crucible, washed with ice-cold water, dried at 100° C. and weighed. The method was considered unreliable, yielding only approximate results.

[4] The method of procedure: A weighed quantity (about 0.5 Gm.) of each of the specimens was transferred to a 500-cc. Erlenmeyer flask, and dissolved in 250 cc. of luke-warm water (previously boiled to remove carbon dioxide); with constant agitation, tenth-normal sodium hydroxide solution was added until neutralized (the base, phenylazo-alpha-alpha-diaminopyridine, was precipitated and the solution became yellow in color); followed by the addition of an excess of alkali (about 1 cc.), the mixture cooled to about 5° C. and allowed to stand for a few minutes. The separated base was removed by filtering through paper, collecting the filtrate and washing with cold water. Finally, the combined filtrate and washings were titrated with tenth-normal hydrochloric acid, using phenolphthalein as an indicator.

From the analytic data it was concluded that the formula $C_6H_5N:NC_5H_2N(NH_2)_2HCl$ phenylazo-α-α-diaminopyridine hydrochloride as given by the manufacturers is correct, and that the Mallinckrodt product appears to be essentially identical chemically with the Merck & Co., Inc., product, both containing minor impurities.

STANDARDS.

Based in part on the information in the literature and in part on the work reported herein, rigorous standards for identity and purity of phenylazo-α-α-diaminopyridine hydrochloride were elaborated. These were sent to Merck & Co., Inc., distributor, for comment and then, with certain slight modifications suggested by them, the following standards were adopted by the Council on Pharmacy and Chemistry for inclusion in "New and Non-official Remedies:"

Pyridium.—Phenylazo-2-6-diamino-pyridine Monohydrochloride.—Phenylazo-α-α-diaminopyridine monohydrochloride. $C_6H_5N:NC_5H_2N(NH_2)_2(2)(6)HCl$. The

monohydrochloride of an azo dye of the pyridine series, phenylazo-α-α-diamino-pyridine. Pyridium contains 28 per cent of nitrogen.

Actions and Uses.—Pyridium has marked penetrating power and is non-toxic and non-irritant in therapeutic dosage. It is rapidly eliminated through the urinary tract. It is bactericidal in aqueous solution against staphylococcus, streptococcus, gonococcus, *B. coli* and even *B. diphtheriæ*. It is proposed for use in gonorrheal infections, urinary diseases and in colon bacillus and mixed infections. In addition to its oral administration it is proposed for irrigation and other local application on the basis of its lack of harmfulness and of its bactericidal activity.

Dosage.—Pyridium is usually administered orally in doses of 0.2 Gm. (3 grains) three times daily either as powder in capsules or as tablets; for local application to wounds, ulcers and infected surfaces an aqueous solution of 0.5 to 1 per cent may be used; for urethral injection a 0.3 per cent solution is used.

Pyridium should not be used in connection with compounds containing mercury as it releases the mercury from such compounds. It is contraindicated in uremia and in severe disorders of the kidneys of a noninfectious type.

Pyridium is only slightly soluble in cold water, about 1 part in 300. However, it will form supersaturated solutions relatively easily. Pyridium will precipitate out of a 2 per cent (supersaturated) solution after approximately two days, it will precipitate out of a 1 per cent solution only after months. A 1 per cent solution may be stabilized for months by the addition of 10 per cent dextrose, U. S. P. X. Aqueous solutions should be prepared with distilled water, as the salts present in the tap water of many localities are liable to precipitate the free base, phenylazo-α-α-diamino pyridine.

Pyridium occurs as a red, odorless, microcrystalline powder, possessing a slightly bitter taste; slightly soluble in cold water, about 0.3 part in 100 parts, soluble in boiling water, about 5 parts in 100 parts; slightly soluble in alcohol, soluble in glacial acetic acid; insoluble in acetone, benzene, chloroform, ether and toluene, although these solvents might be colored slightly yellow by its presence, if the solvents are not entirely free from water; the aqueous solution (1 in 500) is red and is distinctly acid in reaction when measured by means of the hydrogen electrode. On addition of diluted sulphuric acid or a dilute solution of sulphates to an aqueous solution of pyridium, a precipitate forms.

Digest about 0.2 Gm. of pyridium with 10 cc. of diluted hydrochloric acid for thirty minutes at 50° C.; the dihydrochloride separates as small, dark red crystals or scales; decant the supernatant liquid and add 20 cc. of water to the crystalline precipitate; the material dissolves. Dissolve about 0.5 Gm. of pyridium in 500 cc. of water; add an excess of ammonia water; collect the resultant free base, phenylazo-alpha-alpha-diaminopyridine on a filter paper, wash, recrystallize from water and dry at 100° C.; it melts at 137° to 139° C.

Dry about 1 Gm. of pyridium, accurately weighed to constant weight over sulphuric acid in a partial vacuum; the loss in weight does not exceed 1 per cent. Incinerate about 1 Gm., accurately weighed, previously dried over sulphuric acid; the ash does not exceed 0.3 per cent. Dissolve about 1 Gm. of pyridium, accurately weighed, previously dried over sulphuric acid, in 200 cc. of warm water; collect the insoluble matter, if any, in a weighed Gooch crucible; wash the insoluble matter with hot water, dry the residue at 100° C. and weigh; the insoluble matter does not exceed 0.5 per cent. Determine the nitrogen content according to the Dumas method in Clarke's "Handbook of Organic Analysis," 2nd edition, page 199; the nitrogen is not less than 28.0 per cent nor more than 29.3 per cent, when calculated to the dried substance. Transfer about 0.5 Gm. of pyridium, accurately weighed, to a 600-cc. beaker, and dissolve in 250 cc. of water, previously boiled to remove carbon dioxide; the hydrogen chloride content determined

by titration with tenth-normal sodium hydroxide solution using the hydrogen electrode and a calomel cell (normal potassium chloride solution) corresponds to not less than 14.5 per cent nor more than 15 per cent of hydrogen chloride, when calculated to the dried substance.

SUMMARY.

1. Comparative chemical analyses were made of the two different brands of phenylazo-alpha-alpha-diaminopyridine hydrochloride appearing under different proprietary names.

2. Crystallographic examinations indicated: (1) that the second specimen of Pyridium was of a purer quality than the first one; (2) that all specimens appeared to contain a relatively small amount of an impurity; (3) that the second specimen of Pyridium and the specimen of Mallophene were essentially the same quality.

3. Both products contained varying amounts of moisture.

4. The p_H curves of the electrometric titrations proved to be a good criterion in the determination of the identity and purity of the compound. Furthermore, the electrometric titration demonstrates that when the hydrogen chloride was given off on exposure at 100° C., it was only the small quantity in excess of the stoichiometrical amount for a monohydrochloride.

5. The results obtained indicate a slight difference in purity; the Mallinckrodt product contained an excess of hydrogen chloride. The product of Merck & Co., Inc., was satisfactory in hydrogen chloride content but ran high in nitrogen content, indicating probably an impurity, such as an amide, which was not completely removed in the process of manufacture. On the whole, however, it was sufficiently pure for a product of this character.

6. The specimens of Mallophene and Pyridium examined contained essentially the same chemical compound.

7. Standards for phenylazo-α-α-diaminopyridine hydrochloride have been prepared, based on the work herein reported.

FLUECKIGERIANA.

BY EDWARD KREMERS.

V. Flueckiger letters to Power, 1882–1890.

(*Continued from p. 253.*)

Strassburg, Feb. 7, 1886.

MY DEAR FRIEND,

I am pleased with your good news of Jan. 19th and may say that I have already written long ago to the Berlin publisher, Mr. Springer, on account of the translation of the "Grundlagen" (1). So Messrs. Wood & Co. may fairly apply to him for the cliches (2).

As to the "Pharmaceutische Chemie" I have done with the first part, which as you will be well aware is by far the more difficult; so I hope to finish the work toward the end of this year or at least in the very first weeks of 1887. To give the preference to Messrs. Wood for the translation of the Pharm. Chemie I have no objection, still I suppose they will pay the translator. I believe it would be possible to obtain this.

Dr. Tschirch must be styled Lecturer of Botany and Materia medica in the University of Berlin, for he is simply "Privatdocent" (3) and not yet a professor.

Ptychods means a fold; Ptychodeschlauch may best be given as protoplasms retiring in folds or being reduced into folds along the inner surface of the cell wall. I am not aware of any English term exactly corresponding with the dreadful word Ptychodesschlauch, which—on the whole—might as well be omitted by you.

As to additions or corrections to the "Grundlagen" there is, as yet, nothing of much interest. At page 80 you should drop, in the last line, Glandulae Lupuli, for they are by no means unicellular (einzellig). This is a mistake; it would be safe to omit all the 4 lines from "Manche Drogen freilich . . ." to "sind einzellig."

When your letter arrived, I was just very much pleased with Dr. Squibb's visit; he stated that Messrs. Wood & Co. made an excellent business in publishing the Pharmacopœia (4). So they should liberally treat you.

I hope you will continue in the new year in the same prosperous way as shown by your first "Contributions" (5) for the benefit of Pharmacy in your country. As to Germany and especially to Strassburg, nothing new is to be mentioned. In my pamphlet, "Der Pharmaceutische Unterricht in Deutschland," which I believe to have sent you (reprint from the Archiv der Pharmacie) (6) I showed how things should be arranged in my opinion. But nobody cares about it (7). So I continue quietly my work which, as you know, is very little appreciated by my colleagues Messrs. DeBary (8) and Fittig (9), who would rather like to see me leave my post. This I shall do, but at my time; I shall do my best so long as I can.

With kindest regards—Mrs. Flueckiger uniting in them, I remain

Yours very truly,

F. A. FLUECKIGER.

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(1) These are the "Grundlagen der Pharmacognosie," a joint publication by Flueckiger and Tschirch of the year 1885, the translation of which had been proposed by Power in a previous letter. See Flueckiger's letter dated Sept. 16th, 1885. Also footnote No. 3, THIS JOURNAL, page 8.

(2) Cuts.

(3) As Flueckiger states, Tschirch was at that time "Privatdocent fuer Botanik und Materia Medica" at the University of Berlin. Power had apparently proposed to translate the German title with the English "professor," whereas Flueckiger proposes the designation "lecturer." American university terminology has no exact equivalent. In speaking of the German "Privatdocent," the American college man commonly uses the term "docent;" since the designation lecturer, as proposed by Flueckiger, has a different meaning in our academic parlance.

(4) The U. S. P. revision of 1880 was the first one of the new régime in pharmacopœial revision with Dr. Rice as Chm. of the Revision Committee. It was Dr. Squibb who had started the ball a rolling, but had refused to have anything to do with the new scheme. It was from this time on that the U. S. P. became truly the national standard through its adoption by the several state pharmacy laws, the enactment of which became popular at about the same time. With the sale of an unprecedentally large number of copies, therefore, the publication of the U. S. P. became sought by publishers. However, Prof. Flueckiger's logic was not that of the American business man.

(5) Flueckiger here has reference to the "Contributions from the Department of Pharmacy," published by Power in 1885. It was a pamphlet of 61 pages and consisted principally of the theses of the first pharmacy class which had graduated in 1885. In addition there were two papers by Professor Power himself.

(6) *Arch d. Pharm.*, 223 (1885), 321 to 348.

(7) This was also Tschirch's complaint at Berlin. As was seen (footnote No. 3) pharmacy was represented at the largest of the German universities by a "Privatdocent." Disgusted, Tschirch left in 1890. Somewhat later Thoms tried again and in 1903 gained his point when the Pharmaceutisches Institut was established at Dahlem next to the Botanical Garden.

(8) DeBary was Professor of Botany.

(9) Fittig was Professor of Chemistry.

PSYLLIUM SEED PRODUCTION IN INDIA.

Three species of Plantago, known collectively as Spogel Seed, are familiar to Indian drug dealers: *Plantago Ispagula, P. Orata, Plantago Lanceolata* and *Plantago Major, P. Syllium* or *P. Asiatica*. The last is probably best known as the Indian variety of Plantago and is the most widely distributed, being found in Kashmir, Assam, Bhuttan, Bombay and Nilgris. The plants grow best in a dry sandy clay soil and the seeds are ready for harvest in April and May. The plants, including roots, are pulled from the ground and hand-threshed by beating them against a frame of slender wooden rods. Seeds are available for export by July or August. Amritsar is the leading market, although Lahore and Karachi also share in the trade. Prices fluctuate between $3.65 and $4.45 per maund of 82½ pounds. Shipments are made in double gunny sacks holding about 168 pounds. (Assistant Trade Commissioner Paul L. Hopper, Calcutta.)

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All articles in these lists will be presented in abstract form in the bound volumes of the Year Book, which is issued annually. Those desiring abstracts immediately can obtain them for a fee of one dollar each by communicating with A. G. DuMez, University of Maryland, School of Pharmacy, N. W. cor. Lombard and Greene Sts., Baltimore, Maryland.

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JAPANESE MEDICAL AND PHARMACEUTICAL EXPERTS TO GO TO CHINA.

Dr. Sennosuke Yokote, the recognized authority in hygienic subjects of Japan, who retired from active service at the Imperial University of Tokyo, in March, is expected to go to Shanghai to head the Natural Science Laboratory there. He will be accompanied by Dr. Koichi Miyake of the Medical Department of the Tokyo Imperial University and also by Dr. Heisaburo Kondo of the Pharmaceutical Department of the same university, both of whom will attend the medical and pharmaceutical meeting to be held in Shanghai.

A GASOMETRIC ASSAY OF SODIUM NITRITE.

BY EDMOND E. MOORE.

Sodium nitrite assays are nearly all based upon the ability of this compound to reduce $KMnO_4$. The U. S. P. X assay (3) calls for an excess of $KMnO_4$ and the subsequent titration of the latter with oxalic acid. Davy (1) calls attention to the objections to this method and suggests certain modifications.

Reduction methods cannot be safely used for the assay of sodium nitrite tablets as these tablets often contain varying amounts of other reducing substances such as milk sugar, starch, etc.

It is well known that a saturated solution of an ammonium salt will react quantitatively with sodium nitrite liberating nitrogen.

$$(NH_4)_2SO_4 + 2NaNO_2 \xrightarrow{(I)} Na_2SO_4 + 4H_2O + 2N_2$$

This reaction goes to completion in a relatively short time at 100° C. Gailhat (2) proposed a method in 1900 which was based upon this reaction, but due probably to its complexity it never came into favor.

The method outlined here is simple, requires no special apparatus, and but a small amount of the analyst's time. The results secured by different analysts check very well—see Fig. 1.

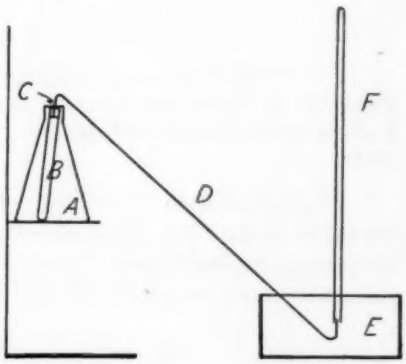

Fig. 1.—Nitrometer. A, Water-bath; B, 12–15-cc. test-tube; C, rubber stopper; D, capillary tube; E, pneumatic trough, partially filled with water; F, 50-cc. burette, filled with water. The end of the capillary tube (D) should be flush with the end of the stopper (C) and there should be a file mark on the test-tube (B) to indicate how far the stopper should be inserted each time.

It is advisable to run two determinations simultaneously. This requires two sets of apparatus but, because of the simplicity of the set-up, it cannot be considered a real disadvantage. A common pneumatic trough can be used for both sets.

Ammonium sulphate is used rather than ammonium chloride which was suggested by Gailhat (2) because of the greater solubility of the former. At 25° C., 100 cc. of water will dissolve 76.7 Gm. of $(NH_4)_2SO_4$ but only 28.2 Gm. of NH_4Cl (4).

It is possible to simplify the calculations without introducing an appreciable error by determining the value of a blank for each apparatus and using this value in all subsequent determinations.

Blank.—10.0 cc. of the saturated ammonium sulphate solution are placed in (B), the apparatus is connected as shown in the diagram and (A) is heated until no more gas collects in (F). The capillary tube is removed from the pneumatic trough and then the volume of gas in (F) is measured. This volume serves as a blank in the assays. The volume of gas here is so small that it can be assumed to be constant because variations in temperature and pressure which occur during different assays will not change it sufficiently to cause a significant error.

Determination.—The sample should contain from 0.08 to 0.12 Gm. of sodium nitrite or a sufficient number of tablets to give that amount of the salt. It is often advisable to weigh 40 tablets, reduce them to a powder and then take an accurately

weighed 0.08 to 0.12-Gm. sample of the product for assay. The sample is placed in the test-tube (B), 10.0 cc. of saturated ammonium sulphate solution are added and the procedure is carried out as in the case of the blank. In order to be certain that the equilibrium is reached at least an hour should be allowed to elapse after the evolution of gas is complete before the burette is read. The temperature, barometric pressure and differences in water level inside and outside of the burette are recorded, and the volume of gas reduced to standard conditions.

$$V = (V_1 - B)\left(\frac{P - P_{H_2O} - \frac{(L.D)}{(13.6)}}{76}\right)\left(\frac{273}{273 + Tc}\right)$$

V = Volume of nitrogen corrected to 0° C. 76.0 cm. V_1 = Volume of gas in burette, uncorrected. P = Barometric pressure (cm. Hg). P_{H_2O} = Tension of water vapor at Tc (cm. Hg). $L.D.$ = Level of water inside burette − level of water outside (cm.). Tc = Temperature Centigrade.

From Equation I it will be evident that 69.01 Gm. of sodium nitrite with an excess of ammonium sulphate will liberate 22,413 cc. of nitrogen, the gas corrected to standard conditions. Therefore, 1.0 cc. of nitrogen gas at 0° C., 76.0-cm. pressure, represents 0.003079 Gm. of sodium nitrite.

$$\text{Per cent sodium nitrite} = \frac{(V)\ (0.003079)}{\text{Weight of sample}}\ (100)$$

The method has been used by different analysts using sodium nitrite samples of known composition, and tablets from different sources. The results have been very satisfactory.

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CORROSION OF METALS BY LIQUID IODINE AND BY MOIST IODINE VAPOR.

BY B. L. MEREDITH AND W. G. CHRISTIANSEN.

As part of a study of the corrosive properties of iodine, several samples of chemically resistant metals have been exposed to the action of molten iodine at 130° C., and of moist iodine vapor at 65–70° C., and quantitative measurements have been made.

In the first experiment six glass-stoppered bottles were filled with resublimed iodine and placed in an oven at 130° C. Each strip of metal was thoroughly cleaned, weighed, measured and immersed in the molten iodine, one strip to a bottle. The stoppered bottles were than allowed to remain in the oven 48 hours. At the end of this time the strips were removed and plunged into alcohol which dissolved off the adhering iodine. The metallic iodides were then washed off with

water, except in the case of lead, where a strong KI solution was used, and the strips were given a final wash with alcohol before drying at 100° C., and reweighing.

In the second experiment the lower portion of an ordinary 8-inch desiccator was filled with resublimed iodine and two cc. of water added. A second set of clean, weighed metal strips were placed in the upper portion of the desiccator on a rack made of small glass rod. The cover was placed on the desiccator, which was then put in the steam closet at 65–70° C. for three days. The strips were then freed of iodine and iodides as in the first experiment and reweighed.

Following is a tabulation of the results:

TABLE I.—MOLTEN IODINE.

	Surface exposed, sq. cm.	Loss in Gm.	Loss in mg. per sq. cm.
Lead	35.1	6.1780	176.0
Carpenter steel	16.9	0.0078	0.46
Ascoloy	34.6	0.1650	4.77
Super ascoloy	26.6	0.0173	0.65
Allegheny metal	28.8	0.0429	1.49
Duriron	35.5	6.1651	173.7

TABLE II.—MOIST IODINE VAPOR.

	Surface exposed, sq. cm.	Loss in Gm.	Loss in mg. per sq. cm.
Lead	33.1	0.0224	0.68
Carpenter steel	17.0	0.2326	13.68
Ascoloy	33.9	0.4092	12.07
Super ascoloy	27.3	0.4385	16.07
Allegheny metal	32.4	0.5447	16.82
Resistol	220.3	2.687	12.20

RESEARCH DEPARTMENT OF THE CHEMICAL AND PHARMACEUTICAL LABORATORIES,
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A METHOD FOR THE SEPARATION AND DETERMINATION OF TOTAL ALKALOIDS AND PHENOLPHTHALEIN IN PILLS.

BY R. L. TAYLOR.*

Place a number of pills equivalent to one grain of alkaloids in a lipped-centrifuge tube. Add 15 cc. of 2% sulphuric acid, and shake until the pills are completely disintegrated. Place the tube in the centrifuge and rotate about five minutes. Remove the tube and decant the clear liquid through filter paper.

Add 5 cc. of the 2% sulphuric acid to the tube and again shake until the residue is thoroughly disintegrated. Rotate the tube in the centrifuge and decant the liquid through the filter as before. Repeat this extraction several times, using 5-cc. portions of the dilute acid, until 2 or 3 cc. of the last portion of dilute acid gives a negative test for alkaloids with Mayer's reagent.

After the alkaloids have been completely extracted from the mixture, add about two Gm. of purified sawdust to the tube and mix well. Filter the contents of the tube through the filter, and rinse the tube with successive small portions of water, filtering the rinsings through the filter containing the residue. Dry the filter paper and residue in the oven at 60° C.

* Instructor in Pharmacy, State College of Washington.

DETERMINATION OF ALKALOIDS.

Place the combined filtrates in a separatory funnel, and make alkaline with ammonia water. Completely extract the alkaloids from the aqueous solution by shaking with successive portions of chloroform, filtering each portion as drawn off. Completely extract the alkaloids from the combined chloroform portions by shaking out with successive portions of 2% sulphuric acid. Make the combined acid portions alkaline with ammonia water, and completely extract the alkaloids with successive portions of chloroform, filtering each portion as drawn off. Evaporate the chloroform solution to dryness on the steam-bath. Add a few cc. of neutral alcohol to the residue, and heat gently until the residue is in solution. Add 10 cc. of $N/10$ sulphuric acid, and titrate the excess acid with $N/50$ potassium hydroxide, using methyl red indicator. Multiply the number of cc. of acid consumed by the alkaloid, by the factor representing the alkaloids and their respective quantities present. The experimental samples contained strychnine sulphate and extract of belladonna and were calculated accordingly.

DETERMINATION OF PHENOLPHTHALEIN.

Fold the dried filter paper containing the residue from the pills and place in a paper extraction thimble. Place the thimble in a Soxhlet extractor and extract with alcohol for several hours, or until the phenolphthalein is completely extracted.

Disconnect the apparatus and transfer the alcohol solution of phenolphthalein to a 200-cc. volumetric flask. Dilute the solution with alcohol to the 200-cc. mark.

Pipette 10 cc. of this solution to a 100-cc. beaker and evaporate to dryness. Precipitate the phenolphthalein as tetraiodophenolphthalein, as recommended by Samuel Palkin.[1]

Filter the precipitate on a tared Gooch crucible. Wash the precipitate of tetraiodophenolphthalein, with successive portions of alcohol which has been saturated with tetraiodophenolphthalein, to remove the precipitated resins. Dry to constant weight at 100° C. and weigh. Multiply the weight of tetraiodophenolphthalein by 0.3871 to obtain the weight of phenolphthalein.

Pill masses containing the following ingredients were made and assayed and the following results obtained:

Ingredients.

Aloin	1.2906 Gm.
Strychnine sulphate	0.0648
Extract of belladonna	0.4315
Podophyllin	0.8640
Phenolphthalein	2.5920

EXPERIMENTAL DATA.

	Total Alkaloids.			Phenolphthalein.		
Sample.	Present.	Recovery.	Error.	Present.	Recovery.	Error.
1	0.0702 Gm.	0.0689 Gm.	1.8%	2.5920 Gm.	2.5725 Gm.	0.75%
2	0.0702 Gm.	0.0692 Gm.	1.4%	2.5920 Gm.	2.5645 Gm.	1.0%
3	0.0702 Gm.	0.0689 Gm.	1.8%	2.5920 Gm.	2.5625 Gm.	1.1%
4	0.0702 Gm.	0.0693 Gm.	1.2%	2.5920 Gm.	2.6000 Gm.	0.3%

[1] *J. Assocn. Official Agr. Chem.*, 8 (1924), 30–36.

THE INTERNATIONAL UNIT OF DIGITALIS.*

BY F. A. UPSHER SMITH.

The standardization of a potent drug like Digitalis presents numerous difficulties due to the fact that there is no one definite chemical constituent that can be taken to represent the full medicinal action of the drug. It is necessary, therefore, to resort to a biological method.

Needless to say biological methods lack the accuracy of chemical methods. They depend upon the reactions of the animal upon which the drug is to be tested, and in many cases these reactions are influenced by weather conditions, the state of health of the animal, the species of the animal, and many other causes.

The methods used in biological assay have not been unified, as is the case in chemical assays. Take the case of the assay of digitalis by means of cats, following the Hatcher and Brody Method. It will be found that in using this method more or less important modifications are used in different laboratories, and these are liable to produce differences in the results obtained by different workers.

When I was visiting the late Professor Cushny in Edinburgh University six years ago he told me that in the case of a sample of digitalis submitted to different laboratories by the League of Nations it had taken twice as much to kill the cats in Edinburgh as it did in London. For about eleven years we have been standardizing digitalis by the Cat Method of Hatcher and Brody, and at times we have noticed considerable difference between our results and those of other workers. The statement of the strength of Digitalis in terms of absolute Cat Units is open therefore to this grave objection that the results are liable to differ in the hands of different workers in different laboratories.

It is as though you asked a number of men to step out, heel and toe, to measure a bit of ground. Their results would vary with the actual length of their feet. If, however, we know the length of each man's foot in linear measure we are able to bring all their results to an agreement. This we have done in the case of digitalis by adopting as our standard the International Standard Digitalis Powder, prepared by the League of Nations. One hundred milligrams of this powder is regarded as an International Unit. We find out by the use of cats how much of a given sample of digitalis is equivalent in toxicity to 100 mg. of the International Standard Powder. This gives us the strength of the sample of digitalis relative to an International Unit. In this way the results of different workers in different laboratories are brought into closer agreement. However much their methods, technique, etc., may vary, by using the same methods and technique, on both the Standard Powder and the sample to be tested, they all obtain relative strengths of the same order of magnitude.

Among different workers a "Cat Unit" in terms of International Standard Powder ranges from 76.3 mg. to 104.2 mg. In other words, with the same Powder some workers find 76.3 mg. to constitute a "Cat Unit" while others consider 104.2 mg. to be a "Cat Unit." In testing another sample of digitalis in the same way these workers would obtain similarly varying results, but on reducing the results to the equivalent of 100 mg. of the International Powder these big variations would tend to disappear.

* Parts of a paper read before Minnesota Pharmaceutical Association.

TABLE I.—DIGITALIS PURPUREA, 1926 CROP, GROWN BY UPSHER SMITH.

Results in Cat Units.

	Observer.	Date.	Mg. = 1 Cat Unit.
1	A	2/1/27	65.0
2	A	2/1/30	68.9
3	B	2/1/30	85.5
4	B	2/1/30	79.85
5	C	2/13/30	62.50

From these results we find the Cat Unit of the 1926 crop ranges from 62.5 mg. to 85.5 mg., a range of 23 mg. But if we calculate the amount of drug each observer found equivalent to an International Unit (100 mg. of the International Standard Powder) it will be noted that the results of the different observers come close together.

TABLE II.—RESULTS IN INTERNATIONAL UNITS.

	Observer.	Mg. International Standard Powder = 1 Cat Unit.	Mg. of 1926 crop equivalent to 100 mg. International Standard Powder.
1	A	77.8	83.5
2	A	77.8	88.5
3	B	104.2	82.05
4	B	104.2	76.6
5	C	76.3	81.9

Here we find an International Unit of the 1926 crop ranges from 76.6 mg. to 88.5 mg., a range of 11.9 mg. In other words, the discrepancy in the results of different workers is here cut in two.

An International Unit of digitalis would appear to be equivalent to about two grains of U. S. P. Digitalis Powder, hence a tincture containing One International Unit in 1 cc. would contain the equivalent of about two grains of U. S. P. Digitalis Powder in 1 cc. Such a tincture would be about 25% stronger than the U. S. P. tincture.

The careful clinician in prescribing digitalis is influenced more by the reactions of the patient than by an arbitrary system of dosage. Following the method of Withering, he gives digitalis until certain symptoms are produced, and then stops the administration. Individual patients are liable to show wide variations in their tolerance of the drug, indeed these variations are probably greater than is generally supposed.

The biological methods that we use to-day in standardizing drugs will no doubt undergo considerable improvement as time goes on. The ideal method of biological standardization would depend upon the clinical effect on an animal rather than the toxic results. Up to the present it has not been found practicable to adopt other than toxic methods in standardizing drugs of the Digitalis group.

The author concluded his article by offering the following suggestions:

1. That the Pharmacopœia Revision Committee consider the desirability of accepting the International Standard Digitalis Powder, as adopted by the League of Nations, as a standard for the U. S. P.

2. That steps be taken to prepare such a standard powder for use in the United States in testing digitalis and its products.

3. That 100 mg. of this powder be recognized as a Unit of digitalis, the same as an International Unit.

4. That the strength of digitalis and its products be stated in terms of an "international unit."

SYRUP OF POTASSIUM GUAIACOLSULPHONATE.

BY CLYDE M. SNOW AND BERNARD FANTUS.

In view of the popularity of guaiacolsulphonate-containing syrups, and the desire felt by many physicians for a preparation of non-secret composition that may readily be prepared extemporaneously by pharmacists, experiments were undertaken to elaborate the most palatable and elegant administration form for this agent, especially with a view of having it considered for possible admission to the National Formulary.

Potassium guaiacolsulphonate is a colorless crystalline powder, odorless, of slightly bitter taste, soluble in water (7.5 parts), insoluble in alcohol and ether. It is alleged to be of value in the treatment of certain coughs in doses of 0.3 to 1.3 Gm. (gr. 5 to 20) three or four times daily.

The following vehicles were tried:

Aromatic syrup of eriodictyon
Syrup of orange
Syrup of tar
Syrup of wild cherry
Compound syrup of sarsaparilla
Compound syrup of asarum
Aqueous elixir of glycyrrhiza

While none of these preparations is disagreeable, it seems that the aromatic syrup of eriodictyon yields the most palatable preparation; the well-known bitter-disguising tendency of yerba santa being more efficient in overcoming the bitterish after-taste of the medicine than any of the other vehicles. We therefore offer the following formula for consideration by the National Formulary Revision Committee.

SYRUPUS POTASSII GUAIACOLSULPHONATIS.

Syrup of Potassium Guaiacolsulphonate.

Abbr.: Syr. Pot. Guaiacolsulph.

Potassium Guaiacolsulphonate	**75.0 Gm.**
Water	**100.0 cc.**
Aromatic Syrup of Eriodictyon, enough to make	**1000.0 cc.**

Mix the potassium guaiacolsulphonate with the water; add the syrup; and after solution is affected filter through cotton, if necessary, and pass enough water through the filter to make the product measure 1000 cc.

AVERAGE DOSE: METRIC, 4 cc. APOTHECARIES, 1 FLUIDRACHM.

One average dose represents about 0.3 Gm. or 5 grains of potassium guaiacolsulphonate.

While at normal temperature, the salt produces a clear solution with the syrup, there is a tendency for the potassium guaiacolsulphonate to crystallize out at lower temperature. This is obviously due to the alcohol contained in the syrup

of eriodictyon. The small proportion of water added stabilizes the preparation at all ordinary temperatures.

The next most pleasant preparation, perhaps, is a simple solution of the salt in syrup of orange. This is the formula of the German, Austrian and the Hungarian Pharmacopœias.

To the physician, the prescribing of this formula offers the advantages of a preparation of a fair degree of palatability of known composition. The above formula is, therefore, submitted to the pharmaceutical profession with the request that it be tested and criticized, to the end that the National Formulary may contain the best possible preparation of this medicinal agent.

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THE VARIABILITY OF PHARMACEUTICAL PREPARATIONS.*

BY H. B. HAAG AND L. E. JARRETT.

Attention has been called upon several occasions to the variability of certain pharmaceutical preparations. Many of these studies have been concerned with drugs very liable to deterioration, such as the liquid preparations of digitalis. The fact that discrepancies have frequently been found should be a challenge to those interested in professional pharmacy and public health. Clinicians have taken some of these observations seriously, so seriously, in fact, that in increasing numbers they are turning to certain types of proprietary preparations in the hope that in these they will find, at least, uniformity. Needless to say manufacturers have apparently not been particularly loath to take advantage of this situation; we have proprietary names for almost every conceivable drug. The sad part of this state of affairs is that much of the blame probably rests with the pharmacist; by neglect in exercising proper professional care of his legitimate business, he is gradually reducing his calling to that of a middle man, pouring from this or that container a preparation which he, by right of his training, should have compounded. This paper is offered with the view of presenting additional information as to the quality of some of the common official drugs and their preparations, with the hope that it will stimulate a lagging professional spirit. While the results herein reported are based upon studies made upon specimens collected throughout Virginia, there is no reason to believe other than that similar results would have been obtained had the samples been collected in any other locality.

Through the generous coöperation of the secretary of the Virginia State Board of Pharmacy, plans were made to collect, in various sections of the state, specimens of some of the more commonly dispensed official drugs, and particularly those which would lend themselves relatively easily to analytical study. Ten samples of each specimen were to be obtained from different pharmacies. The original plan was to obtain samples of the following: Tincture of Digitalis, Diluted Hydrochloric Acid, Spirit of Nitrous Ether, Liniment of Camphor, Saturated Solution of Potassium Iodide, Spirit of Camphor, Sodium Nitrite, Tincture of Iodine, a

* Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing, A. PH. A., Baltimore meeting, 1931.

percentage ointment, and Solution of Hydrogen Peroxide. Up to the present time analytical studies have been made upon the first four. This laboratory was supplied with these preparations in the original one-fluidounce bottles, with the original label substituted by a number, so that at no time was the source of any of these specimens known.

TINCTURE OF DIGITALIS.

Ten specimens of Tincture of Digitalis were received from the secretary of the Virginia State Board of Pharmacy in December 1929, and the following tests were made shortly after receipt in this laboratory. In addition, two other preparations, numbers three and five, were secured from the Drug Room and Hospital Pharmacy of this institution, respectively. These were all assayed biologically by the Cat Method of Hatcher and Brody (1). As will be recalled, judged by the "cat method" a standard preparation is one which, when run continuously into the femoral vein of a cat, will produce death in about ninety minutes in a quantity corresponding to 100 mg. of the leaf per Kg. of bodyweight. This amount per Kg. is called a "cat unit" and it follows that the smaller the numerical figure representing the "cat unit" the more potent the preparation. It is of course necessary to arrive at this figure from the average of several assays. Determinations were made of the hydrogen-ion concentration of most of the specimens by means of the quinhydrone method. Table I illustrates the results of these studies on each specimen.

TABLE I.

Specimen number.	Activity (mg. × Kg.).	p_H.	Specimen number.	Activity (mg. × Kg.).	p_H.
1	76.0	4.06	7	126.0	4.4
2	99.0	4.15	8	137.0	4.15
3	106.0	..	9	142.0	5.5
4	109.0	4.32	10	143.0	4.38
5	110.0	..	11	164.0	4.32
6	115.0	4.66	12	267.0	4.32

It becomes immediately evident from this tabulation that the various tinctures show great differences in activity, and that there appears to be no definite relationship between the hydrogen-ion concentration and the physiological activity. Of the twelve specimens assayed only about fifty per cent were within the standards set for a good preparation. These findings resemble those presented in a recent similar study by Ward (2). Attempt was made to assay these specimens using frogs, but the results in the main were not encouraging; there was often wide variation among frogs when tested with the same specimen and, even more frequently, marked discrepancies when the results so approximated were compared with the tests obtained upon cats. These difficulties encountered when using the frog method have frequently been stressed in the literature bearing upon the subject. In spite of the fact that the glucosides of digitalis are hydrolyzed by acids, the most active specimen was the one with the highest hydrogen-ion concentration. Of course the question of the age of the samples probably plays a great part, and it is easily conceivable that the more potent tinctures might have been of the most recent manufacture. The figures indicating the hydrogen-ion concentration for these specimens are in keeping with similar studies made by

other investigators (3, 4, 5, 6). While it has been shown that most tinctures of digitalis deteriorate slowly, it is also known that some tinctures deteriorate rather rapidly. Hence it would appear advisable for pharmacists who do not have a great demand for Tincture of Digitalis to purchase this preparation in small quantities so as to refresh their supply at short intervals. Better still it would be to persuade physicians to use the powdered leaf, which is known to be stable for years.

DILUTED HYDROCHLORIC ACID.

On the twenty-first of August 1929, ten one-fluidounce specimens of Diluted Hydrochloric Acid were received. These were assayed according to the U. S. P. X requirements on August twenty-seventh, 1929, with the results as given in Table II. In addition, specimens numbers three and seven were obtained from the Drug Room and Hospital Pharmacy of this institution, respectively.

TABLE II.

Specimen number.	Per cent HCl.	Specimen number.	Per cent HCl.
1	2.9	7	10.90
2	9.25	8	11.6
3	9.74	9	11.9
4	10.09	10	12.8
5	10.40	11	12.8
6	10.90	12	12.9

The U. S. P. X states that Diluted Hydrochloric Acid shall contain not less than 9.5% or more than 10.5% HCl. It will be observed that, with the exception of specimen number one, most of the preparations range either within or close to the official requirements. The last three or four are somewhat higher in their HCl content than they should be, and while for practical purposes this difference is negligible, there is little excuse for this preparation showing such variation. It is almost inconceivable how one could misinterpret the simple directions of the pharmacopœia for preparing Diluted Hydrochloric Acid, yet apparently some gross misinterpretation must have been exercised when number one was prepared. It might be argued that a mistake of this nature, inasmuch as it does not result in a toxic product, should not be severely condemned. However, discrepancies such as this weaken the physician's regard for official preparations, and pave the way for the introduction of some proprietary drug.

SPIRIT OF NITROUS ETHER.

On the second of November 1929, ten one-fluidounce specimens of Spirit of Nitrous Ether were received, and on the next day they were assayed according to the directions in the U. S. P. X. At least two tests were made upon each one, and the potency judged from an average of the two assays. Table III shows the results so obtained.

TABLE III.

Specimen number.	Per cent ethyl nitrite.	Specimen number.	Per cent ethyl nitrite.
1	1.82	6	2.65
2	2.07	7	2.74
3	2.18	8	3.03
4	2.63	9	3.82
5	2.64	10	4.50

The U. S. P. X requires that Spirit of Nitrous Ether contain not less than 3.5% or more than 4.5% ethyl nitrite. Only two of the preparations assayed within the pharmacopœial requirements, the remainder being below the minimal standards. These findings are in harmony with the results frequently mentioned in pharmaceutical literature (7, 8, 9, 10). In addition to the above specimens an additional one was secured directly from a local manufacturing jobber. Upon analysis this was found to contain slightly above three per cent ethyl nitrite, but was not within the pharmacopœial limits.

LINIMENT OF CAMPHOR.

Ten specimens of Liniment of Camphor were received on March 10, 1929, and tested during the next several days. Three assays were made upon each sample, the tests being made as directed by the tenth revision of the Pharmacopœia. The average of these assays is given in Table IV.

TABLE IV.

Specimen number.	Per cent camphor.	Specimen number.	Per cent camphor.
1	18.1	6	19.3
2	18.3	7	19.5
3	18.6	8	19.7
4	18.9	9	20.0
5	19.3	10	22.0

The official requirement for Liniment of Camphor is that it should contain not less than 19.5% or more than 20.5% camphor. These specimens show the least variation of any tested, and as a whole approach more closely the pharmacopœial requirements. The fact that most pharmacists manufacture this preparation in their own laboratories makes these findings rather encouraging.

SUMMARY AND CONCLUSIONS.

Tinctures of Digitalis purchased from various pharmacies in Virginia show great variation in activity when tested by the Cat Method. There appeared to be no definite relationship between the activity of the tinctures and the hydrogen-ion concentration. Pharmacists are urged to purchase their supplies of Tincture of Digitalis in such quantities as to insure a fresh lot at short intervals.

Specimens of Diluted Hydrochloric Acid, while in the main of pharmacopœial potency, show variation in some instances. One specimen is cited which contained only about thirty per cent as much HCl as is required by the pharmacopœia.

Spirit of Nitrous Ether was found to be in most instances well below the U. S. P. X requirements.

Liniment of Camphor, of all the preparations tested, showed the most concordant assays.

In order to combat the inroads being made by proprietary preparations and in order to bring back to pharmacy its rightful heritage, it is urged that pharmacists exercise more care in the strictly professional side of their business.

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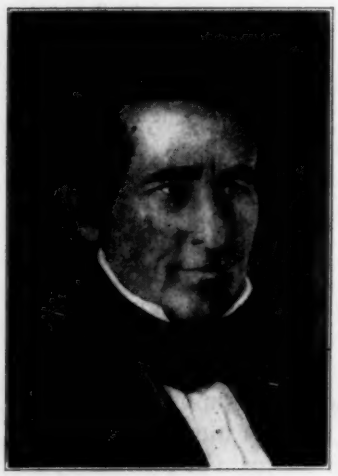
DR. FRANKLIN BACHE, CHAIRMAN OF U. S. P. REVISION COMMITTEE,* 1860.

BY CHARLES H. LAWALL.

Dr. Franklin Bache was a native of Philadelphia and a great grandson of Benjamin Franklin. His father was Benjamin Franklin Bache, editor of the *Aurora*, a Philadelphia newspaper, famed for its opposition to Washington and Adams and the Federalists. He was born in 1792. His early education was obtained in the private school of Dr. Wylie, after the completion of which he graduated from the University of Pennsylvania, first as a Bachelor of Arts, in 1810, and later, in 1814, as Doctor of Medicine. In this same year he became a Master Mason in Franklin Lodge 134 of Philadelphia, which had been named for his illustrious ancestor.



DR. FRANKLIN BACHE.

His first experience in medicine was obtained as surgeon's mate in the Army in which service he spent three years and had attained the full rank of surgeon at the time of his discharge.

He occupied several minor positions as physician to several Philadelphia prisons during the early years of his private practice. He became particularly interested in science in general and in chemistry particularly and, in 1819, he published a "System of Chemistry for the Use of Students of Medicine."

Along with Dr. Samuel Jackson, another celebrated young Philadelphia physician, he organized a Philadelphia branch of a medical association of national scope called the *Kappa Lambda* Society, founded in Louisville, Ky., in 1822 by Dr. Samuel Brown. This society had a great influence in promoting harmonious relations between physicians and raising ethical standards in the profession of medicine.

Dr. Bache became the first lecturer in chemistry, in 1826, in the Franklin Institute, which had just been founded two years previously, and which was then functioning as a teaching institution in the Arts and Sciences. He had previously

* Section on Historical Pharmacy, A. PH. A., Baltimore, Md., 1931.

had some lecturing experience in chemistry in the private medical school of Dr. Thomas T. Hewson, who had so many private pupils that he was compelled to adopt systematic teaching methods for them.

It was through his friendship with Hewson that Bache met Dr. Wood, the second lecturer on Chemistry in the Philadelphia College of Pharmacy, who had succeeded Dr. Gerard Troost in that chair a year after its founding in 1821, and these two young men became actively identified with the revision of the United States Pharmacopœia during the first decade of its existence, and at a time when there must have been considerable professional jealousy of a sectional character, for in 1830 there were two rival editions of the U. S. P. published, one in New York and the other in Philadelphia.

In 1831 Dr. Wood was transferred from the chair of Chemistry in the Philadelphia College of Pharmacy to the chair of Materia Medica and Pharmacy, and Dr. Bache succeeded Dr. Wood in the same institution as professor of chemistry, which chair he held for ten years, when he resigned to accept a similar professorship in Jefferson Medical College.

In 1833 Dr. Bache had associated himself with Dr. Wood in the publication of a *commentary* on the United States Pharmacopœia which was christened the "United States Dispensatory." This work, which had an immediate success, is now in its 21st Edition.

Dr. Bache continued his interest in and affiliation with the work of revising the United States Pharmacopœia and was an active participant in the conventions of three successive decades 1840–1850 and 1860.

In 1860 he became chairman of the Committee on Revision of the United States Pharmacopœia and during the active period of revision had assembled an active group of workers about him, who held meetings at his home at least once a week for more than a year, at which every detail of the text of the proposed new Pharmacopœia was given most careful consideration.

Dr. Bache received many honors at the hands of his fellow-scientists and professional men. He was president of the American Philosophical Society, honorary member of the AMERICAN PHARMACEUTICAL ASSOCIATION and vice-president of the College of Physicians of Philadelphia.

As a man he was somewhat reserved in his deportment but was constant in his friendships and esteemed by all who knew him.

Dr. Bache died in 1864 full of days and honors. The finest thing that could be said about him is taken from the *dedicatory* paragraph of a book which his fellow-worker, Dr. Wood, had dedicated to him some years before his death:

"Whom in the course of an intimate acquaintance of thirty years, I have never known to do an unjust act or cherish an unjust thought; the accurate man of science, the skilful teacher; the upright and honorable man, and in all points the gentleman."

VENEZUELA IMPORTS OF MEDICINALS FROM U. S.

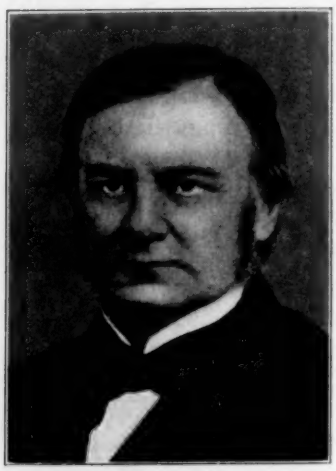
Venezuela is the third leading market in South America for American medicinal preparations. Sales were maintained well in 1930, total exports of medicinal and pharmaceutical products from the United States to Venezuela amounting to about $600,000. While this figure is lower than the value of exports in 1928 and 1929, which amounted to $654,000 and $796,000, respectively, the decline was proportionately less than that suffered by certain other South American countries.

DR. JOSEPH CARSON, CHAIRMAN OF U. S. P. REVISION COMMITTEE, 1870.*

BY CHARLES H. LAWALL.

Dr. Joseph Carson was the son of Joseph and Elizabeth (Lawrence) Carson. He was born in Philadelphia on April 19, 1808. His parents were of Scotch ancestry. He received his early education in two of Philadelphia's famous private schools (White's School and the Germantown Academy), after which he graduated as an A.B. at the University of Pennsylvania at the age of 18. He entered the employ of the wholesale druggist, Edward Lowber, and in that environment became interested particularly in botany, through the crude vegetable drugs which he handled.

In order to gratify his desire for a scientific education he again attended the University of Pennsylvania, where in 1830 he received the degree of M.D., as, at that time, it was only in medical courses that the natural and physical science teachers were available. His medical preceptor was Dr. Thomas T. Hewson, who had taken him in as a medical apprentice, as was commonly the practice in those days.



DR. JOSEPH CARSON.

Immediately after his graduation in medicine, he became a resident physician at the Philadelphia General Hospital, then known as Blockley. Here he remained for a year, after which he spent several years as surgeon on an East India Merchantman, gaining much professional skill and making a collection of many interesting scientific specimens.

Upon his return he became lecturer on Materia Medica and Pharmacy in the Philadelphia College of Pharmacy, succeeding Dr. Robert Egglesfield Griffith in that chair. He also lectured at the Philadelphia Medical Institute from 1844 to 1848. In 1850 he resigned his position at the Philadelphia College of Pharmacy and accepted a similar chair at the University of Pennsylvania, which he held until 1876. He retired from teaching and became *Professor Emeritus*.

During his teaching years at the Philadelphia College of Pharmacy, he had prepared a notable work on medical botany, published in 1847, in two volumes, illustrated with 100 colored plates.

Coincident also with his teaching years at the Philadelphia College of Pharmacy he was editor of the *American Journal of Pharmacy*. During this period he contributed 76 original papers, and also had the satisfaction of training as his editorial assistants two young men, both of whom became associated with him on the faculty of the college. One of these was Robert Bridges, professor of chemistry from 1846 until 1879; the other was William Procter, Jr., now known and revered as the "Father of American Pharmacy."

Among other literary works was his "History of the Medical Department of the University of Pennsylvania," written in 1869 and containing sketches of the

* Section on Historical Pharmacy, A. PH. A., Baltimore meeting, 1930.

lives of deceased professors from the time of its founding in 1765. He also edited *Pereira's Materia Medica.*

Dr. Carson had many activities outside of his teaching and literary work. For seventeen years he was the curator of the American Philosophical Society and for some years librarian of the Academy of Natural Sciences, to whose botanical collections he made many contributions. He was one of the founders of the American Medical Association and a president of the Philadelphia County Medical Society.

In 1870 he became both president of the U. S. P. Pharmacopœial Convention and chairman of the Revision Committee for the succeeding decade.

The revision over which he presided was the last one in which the members of the medical profession were in the majority, and the 1870 U. S. P. was the last one to be encumbered with many difficult formulas and to have very few tests for identification and purity.

THE CENTENARY OF CHLOROFORM.

Chloroform was discovered in 1831 by Samuel Guthrie, Baron von Liebig, and Eugene Soubeiran. Guthrie named his product "chloric ether;" Soubeiran, "bichloric ether;" Liebig, "trichloride of carbon;" Dumas, in 1834, gave to it the name of "chloroform."

Part of the following is abstracted from an article by Ossian Guthrie of Chicago in the *Western Druggist* for February 1894. Records indicate that Guthrie has a prior claim, certainly not later than October 1831, and records show that his discovery was probably made in May of 1831. The method of manufacture is described by Dr. Guthrie, in his own language, as follows:

"Into a clean copper still put three pounds of chloride of lime and two gallons of well-flavored alcohol of sp. gr. 0.8444 and distil. Watch the process, and when the product ceases to come highly sweet and aromatic remove and cork it up closely in glass vessels. By redistilling the product in a great excess of chloride of lime, in a glass retort, in a water bath, a greatly concentrated solution is obtained. This new product is caustic and intensely sweet and aromatic. By distilling solution of chloric ether from carbonate of potash the product is concentrated and refined. The remainder should be distilled off for a new operation. These proportions are not essential—if more chloride of lime be used, the ethereal product will be increased; nor is it necessary that the proof of the spirit should be very high, but I have commonly used the above proportions and proof, and have every reason to be satisfied with them. From the above quantity I have usually obtained about one gallon of ethereal spirit." (Note.) "The affinity of chlorine to lime is so weak, and to alcohol is so strong that the chlorine is all taken up long before the distillation is over; hence, the absolute necessity of watching the process so as to know when to set aside the ethereal portion."

This is practically the description given in the U. S. Dispensatory for 1845 on page 1241.

Dr. Guthrie supplied his product to Professor Silliman and also to Dr. Eli Ives, one of the faculty of Yale College. The latter became greatly interested and administered it in various cases and published an account of his administration and the results in the *American Journal of Science and Arts* at the close of the year 1831. Among Dr. Ive's patients was a consumptive to whom he administered by inhalation the first chloroform ever administered in that manner; Simpson, however, was the first to use it in surgical practice.

Dr. Guthrie was led to prepare chloroform by his peculiar process from noting a passage in Professor Silliman's "Elements of Chemistry," which refer to the chlorine ether of the Dutch chemists as being a grateful diffusible stimulant when properly diluted. He supposed that he had fallen upon a cheap and easy process for obtaining this long-known ether without being aware that in reality he had obtained a new compound. The "U. S. Dispensatory" (1845) gives its medical properties in the following: "It acts as a diffusible soothing stimulus in the same manner as sulphuric ether but with this decided advantage, that when sufficiently diluted it possesses a bland sweet taste which renders its administration easy even to children. It has been used with advantage in asthma, spasmodic cough, the sore throat of scarlet fever, atonic quinsy and other diseases in which a grateful and composing medicine is indicated. Professor Ives and Dr. N. B. Ives of New Haven speak favorably of its effects. The dose for an adult is a teaspoonful diluted with water. In affections characterized by different respirations it may be used by inhalation. It is employed for medicinal purposes in alcoholic solution."

Samuel Guthrie was born at Brimfield, Mass., in 1782, where he studied medicine with his father, and also, later, in New York and Philadelphia. In 1803 he emigrated to Smyrna, N. Y., where he began the practice of his profession and also established a laboratory for the manufacture of explosives, supplying the Government with them. He was surgeon in the U. S. Army during the War of 1812, and invented the punchlock, replacing the flintlock musket. He died at Sacketts Harbor, October 18, 1848, aged sixty-six years.

PHARMACY IN CLASSICAL ANTIQUITY.*

BY LEO SUPPAN.

Pharmacy, in its origins, was associated with the idea of evil—an example of the passing of the connotation of a word into its opposite, for the pharmacist is now recognized as a member of society whose aim is the public good, and that not only in coöperation with the physician.

The very name "pharmacy" is suggestive of the original association, for the word φάρμακον always meant for the ancients "poison," and it was not until later, by a process of generalization that it became applied to drugs possessed of beneficial properties.

That poison should in the earlier periods of man's history be associated with the practices of magic and religion is but natural. Everything exerting power, be it in a great or in a minor measure, calls forth, in the primitive consciousness, fear. It may, and does become, therefore, a powerful weapon in the hands of the priest. We see this in the employment of ordeal poisons among the primitive tribes of Africa. In instances of this kind the use of poisons serves an ethical purpose and its use must, in the minds of simple people, be justified as in the end promoting some good, remote as that end may be.

But what can be used to promote good may also be turned to evil, and in this latter application the results may be so formidable and startling as to overshadow

* Section Historical Pharmacy, A. PH. A., Rapid City meeting, 1929.

quite, in popular opinion, the other aspect. Beside the priest stand the sorcerer, the wizard, the witch, and these birds of ill omen are credited with possessing an intimate knowledge of poisonous substances, particularly poisonous plants. The materia medica falls under suspicion.

In the traditions of classical antiquity two names of women skilled in poisons are especially famous—Circe and Medea, and both are intimately associated with the sinister "goddess of three forms," Hecate. Circe, daughter of Helios by the Oceanid Perse, is familiar to all readers of the Odyssey. Medea is by some logographers called daughter of Aeetes, King of Colchis and the Oceanide Idyia, while others make Hecate her mother. Aeetes was also brother of Circe, so that both Circe and Medea are connected with Hecate. Temples to Hecate dotted the region from Colchis to Paphlagonia, and these districts, but Colchis notably so, were noted as the habitat of poisonous plants of various kinds and flourishing in marvelous abundance. Medea became a great favorite in the classic imagination, almost an incarnation of evil, although Euripides has given her a more sympathetic touch, probably feeling that her dreadful acts as described in his tragedy were more or less justified by the brutal treatment that she had received at the hands of her faithless husband, Jason.

Medea appears to be a creation of Post-Homeric times, for she is mentioned neither in the Iliad nor Odyssey, unless she is to be identified, as she has by some scholars, with Agamede, daughter of Augeas.

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The best known exploit of Medea, as a sorceress, is that which she performed in connection with Jason's expedition to Colchis in search of the Golden Fleece. The skin of the ram which had borne Phryxos safely to Colchis had by him been nailed to a tree as a votive offering in gratitude for his safe transit, and was guarded by an ever watchful dragon. It was necessary to divert the attention of this monster, which Medea accomplished by preparing a decoction of magic herbs; this she sprinkled upon his eyes by means of a branch of juniper, whereupon he sank into a deep sleep.

When Jason returned with the fleece he was denied the reward which King Pelias had promised him. For this Medea plotted revenge, and she decided to strike the old man indirectly through his own daughters. To this end she selected an old ram from among the flocks of Pelias, cut him into small fragments, and, having boiled these together with certain plants, finally brought the animal out of the cauldron in the form of a vigorous lamb. The daughters of Pelias were naturally astonished at this phenomenon, and it was easy for Medea to convince their credulity that their aged father could in like manner be restored to youth. Persuaded, the maidens dismembered him and threw the portions into the cauldron. Medea pretended that the success of the enterprise depended upon an invocation to the moon. She mounted to the roof in order to pronounce it, and there gave the fire signal which had been agreed on to summon Jason and his Argonauts into the town.

Whatever plants of a powerful toxic character were employed in those early times, medicinally or for nefarious purposes, were evidently derived from various localities, and it is probable that at some dim, remote period this circumstance

gave rise to the legends associating certain persons skilled in drugs with those regions. Thus Medea was a Colchian, as Colchis was noted for its poisonous plants. It was reported that the Colchian rulers had established a kind of medicinal plant garden on the banks of the Phasis, which imagination embellished with fit appointments. The garden was believed to be surrounded by a wall more than fifty feet in height, and was pierced by triple iron doors guarded by Artemis—undoubtedly in her form of Hecate—and her fire-eyed dogs. In an adjacent enclosure were grown drugs of an alexipharmic character. Iberia and Thessaly were as famous for their poisonous plants as was Colchis. The Thessalian witches are known to every school boy. Horace alludes to them frequently, embodying their character and practices in the infamous Canidia.

"Tu donec cinis (2)
Iniuriosis aridus ventis ferar,
Cales venenis officina Colchicis."

he cries out in one of his odes; and in another having heard his neighbor at the banqueting table confess his passion for a notorious coquette, he exclaims:

"Quae saga, quis te solvere Thessalis (3)
Magus venenis, quis poterit deus?"

At a later period Claudian alludes to them:

".....sed castra secutas
Barbara Thessalidas patriis lunare venenis
Incestare jubar" (4).

Lucan, too, tells that Thessaly produced on its rocky slopes poisons that were dangerous even for the gods:

"Thessalia quin etiam tellus herbasque nocentis
Rupibus ingenuit, sensuraque saxa canentis
Arcanum ferale Magos, Ibi plurima surgunt,
Vim factura deis."

In the time of Augustus, Rome was full of sorcerers and poisoners, and their presence was a source of offense to men of sense, and of indignation to satirists. Later emperors issued edicts against the practices of this vicious element of society, but they were of little effect. Horace expressed his feelings in a vigorous ode:

"Cum mihi non tantum furesque feraeque suetae (5)
Hunc vexare locum, curae sunt atque labori,
Quantum, carminibus, quae versant atque venenis
Humanos animos."

The most famous professional poisoner of antiquity was unquestionably the Roman woman, Locusta. It was she whom the infamous Agrippina called in when meditating the death of Emperor Claudius. Tacitus has left us a graphic account of this crime in his *Annals*. He says: "In the midst of these distractions, Claudius was attacked by a fit of illness. For the recovery of his health he set out for Sinnessa to try the effect of a milder air and the salubrious water of the place. Agrippina thought she had now an opportunity to execute the black design which she had long since harbored in her breast. Instruments of guilt were ready at her

beck, but the choice of the poison was still to be considered: if quick and sudden in its operation, the treachery would be manifest; a slow corrosive would bring on a lingering death. In that case, the danger was that the conspiracy might, in the interval, be detected, or in the weakness and decay of nature, the affections of a father might return and plead in favor of Britannicus. She resolved to try a compound of new and exquisite ingredients, such as would make directly to the brain, yet not bring on an immediate dissolution. A person of well-known skill in the trade of poisoning was chosen for the business. This was the famous Locusta, a woman lately condemned as a dealer in clandestine practices, but reserved among the instruments of state to serve the purposes of dark ambition. By this tool of iniquity the mixture was prepared. The hand to administer it was that of Halotus, the eunuch, whose business it was to serve the Emperor's table and taste the viands for his master.

"The particulars of this black conspiracy transpired some time after, and found their way into the memoirs of the age. We are told by the writer of that day that a palatable dish of mushrooms was the vehicle of the poison. The effect was not soon perceived. Through excess of wine or the stupidity of his nature, perhaps the strength of his constitution, Claudius remained insensible. An effort of nature followed, and gave him some relief. Agrippina trembled for herself; to dare boldly was now her best expedient. Regardless of her fame and all that report could spread abroad, she had recourse to Xenophon, the physician, whom she had seduced to her interest. Under pretense of assisting Claudius to unload his stomach this man, it is said, made use of a feather tinged with the most subtle poison, and with this instrument probed the Emperor's throat. With the true spirit of an assassin he knew that, in atrocious deeds, a feeble attempt serves only to confound the guilty, while the deed executed with courage consummates all, and insure to earn the wages of iniquity."

How did this army of poisoners obtain its drugs? The poets, as a rule, represent them as attending themselves to the collecting; but there can be no doubt that so far as the large towns are concerned, much of the material consumed came through regular channels of trade, for there was a demand for legitimate medicinal drugs as well. Horace's Canidia, whoever she was,[1] and her colleagues probably obtained their "magic herbs" from dealers in drugs who were plentiful in Rome. These women might be compared to the modern distributors of narcotics, purveyors to the underworld. The drug dealers of Rome may fairly be suspected of catering to their class.

It must be remembered that both Greeks and Romans looked upon trade of any kind as beneath the dignity of a free citizen, and so the distribution of any kind of produce was left to the lowest orders of the population, in many cases slaves. This contempt extended even to the practice of medicine. Of course there were, in Greece and Rome, physicians of great ability and of high social standing; but the generality of the medical men was undoubtedly of shady character. There was, besides, a horde of irregular practitioners who catered to the ignorant and vulgar, practicing upon their credulity and reaping a rich reward. Of these were various classes: the rhizotomes, the pharmacopoles, the pharmacotides, the pharmakoi; many mid-wives, too, carried on an irregular practice. In a state where the prac-

[1] Her real name is said to have been Gratidia, and she was for a time Horace's mistress; deserting him, she became the object of his wrath, and he revenged himself by clothing her with the character of a class, and giving the name of Canidia. A caddish performance! But all this is merely conjecture.

tice of medicine is not regulated by specific statutes such conditions must necessarily prevail and the quack finds a profitable seedfield.

The rhizotomes were, as the name indicates, originally rootcutters or diggers, that is, collectors of crude drugs, which they furnished the physicians upon order. The precise relation which they held to the physicians is not known, but it is certain that they held a considerably lower rank, for Galen places them in the same class with barbers, cuppers, setters of leeches and the like. Many of the rhizotomes, however, aside from their legitimate connection, picked up business among the lower herd and enforced it by a hocus-pocus which gained them considerable credit from those that liked that sort of thing. These quacks must not be confounded with men of a profession called the "medical rhizotomes" who were really the medical scientists of those days and the first pharmacologists. We may regard them as the founders of medical botany.

The pharmacopoles were druggists of a *louche* type. In their shops, or rather booths, were sold drugs of inferior quality and doubtful efficacy. These dealers exhibited, besides, an assortment of "side lines," such as magical rings, burning-glasses, amulets and cosmetics; abortifacients, secret mixtures for venereal diseases, and frankly, poisons were a regular stock in trade. We have indications that they acted as "matrimonial agents," a term covering a multitude of possibilities. Remembering what the Roman satirists tell us of the practice among Roman ladies of secretly removing objectionable husbands, it may be surmised that the pharmacopoles in many cases furnished them with the weapon.

The mixing and dispensing of drugs and poisons was the occupation of the pharmakoi, whose customers were the pharmakides, the latter a class of go-betweens of the pharmakoi and the ultimate consumers.

This classification of drug dealers as they existed among the Greeks and Romans must not be insisted on too sharply; only the salient points regarding the individual trades are here considered. There was probably considerable overlapping in practice. In neither Greece nor Rome, however, was there a profession corresponding to the later apothecaries; the Roman *tabernæ* have been stated to be shops owned by Greek physicians who had emigrated to Rome in considerable numbers. These physicians cannot have held an exalted rank in their profession, for they sold their services for what they could get and they dispensed their medicines in the *tabernæ*, which were actually shops where all kinds of things were sold, many of them for illicit purposes. Two shops supposed to have been *tabernæ* were unearthed among other buildings at Pompeii; they bore on the outside a figure of the serpent of Aesculapius and a pine cone. Berendes holds, however, that these images were not the symbols of the drug merchants but of the physicians. The shops at Pompeii, and possibly throughout the extent of the Roman world, were open in front and were closed at night by means of wooden shutters, resembling in this respect our market stalls. Travelers will recall that many shops of this kind are still to be seen in southern Europe.

In Rome we find a more extensive ramification of the functions exercised by the dealers in drugs than was the case in Greece. The Pharmacopoles sold all kinds of wares besides drugs and medicines, of which they disposed by peddling. The *pharmacotritæ*, were, as the name indicates, "rubbers" or powderers and mixers of drugs; they were assistants to the *medicamentarii* or herbalists, dealers in medici-

nal plants. Many Greek and Egyptian physicians came to Rome, and they brought with them the knowledge of many exotic drugs which they had used in their own countries. There necessarily arose a commerce in these articles, and it is probable that the *medicamentarii* came to act as middlemen between the producers and physicians. Instead, however, of devoting their attention to the legitimate end of their business they, in the course of time, became guilty of unprofessional practices, for, in the code of Theodosius, they are roundly denounced as worthless rogues; indeed, their name became synonymous with that for traders in poisons. The *pharmacopœius* is mentioned in Roman documents. The name would indicate that he was a maker of poisons or of medicines; it may be that his profession only represented the worse class of *medicamentarii*.

The *pigmentarii* were originally dealers in such drugs as were used in coloring and dyeing, but they appear to have developed into dispensers of medicines on the prescriptions of physicians, thus attaining to a professional or, at least, semi-professional rank. This, however, did not serve, it appears, to improve their social standing, for we read that the emperor Claudius excluded them from all public offices.

The *seplesarii* were a class whose business has been a matter of considerable discussion among historians. The *seplesarii* was the name of a street in the town of Capua, and this thoroughfare was occupied almost entirely by perfumers and pomade and ointment makers, and the name was, toward the end of the Republic, transferred to Rome and applied to persons of this trade. Some modern writers hold that the *seplesarii* sold drugs and medicaments to physicians only, being thus purveyors to the dispensing doctor. Later they appear to have freed themselves from this dependence upon the physicians and to have sold to the public.

In the city of Rome the various trades were segregated, a result either of custom or tradition. The quarter at the foot of the Capitoline hill was a "shopping district" and was known as the *Vicus unguentarius*, the ointment-makers' quarter. It must have been a busy and crowded place, and the great fire which destroyed a great part of Rome in the reign of Nero must have found it a rich prey.

All the drug merchants mentioned were derived by Wootton from the Greek herbalists. In his "Chronicles of Pharmacy" he says:

> "The earlier Greek and Roman physicians were in the habit of themselves preparing the medicines they prescribed for their patients. But, naturally, they did not gather their own herbs, and as many of those used for medicines were exotics, it is obvious that they could not have done so if they had wished. The herbalists who undertook this duty (*botanologoi*), in Greek developed into the *seplasarii*, *pharmacolpoloi* and *pigmentarii* already mentioned. Beckmann says that they competed with the regular physicians, having acquired a knowledge of the healing virtues of the commodities they sold and the method of compounding them. This could not help happening, but it ought to be remembered that the physicians of all countries have themselves developed from herbalists—that is, if we abandon the theories of miraculous instructions which are found among the legends of Egypt, Assyria, India and Greece."

Pharmacy as an art could not rise above the conditions in which it grew up. Had the Greeks had the scientific mind as they possessed in so eminent a degree the philosophical, the ancient dealers in and preparers of medicine would have furnished us with a picture more pleasant to contemplate. It was only when science was liberated from superstition that progress became possible in the arts, for efficient

practice rests upon scientific principles. To be sure, antiquity presents a few glorious names in medical science; the men who bore them sought to interpret facts in the light of reason, and thus they arrived at a number of general truths; but they stood isolated from the mass, and it was only by a few enlightened princes that their abilities were recognized. Unfortunately, the character of a period takes its color from the general mass of mankind rather than from the small number of choice spirits that shine as stars of the first magnitude. If we are to seek for those beginnings from which modern pharmacy traces its lineal descent, we must go to the period of the first Renaissance, the thirteenth century, the time of the greatest of all the Hohenstaufens, the emperor Frederick the Second. This was the era that prepared for the greater intellectual awakening of the fifteenth century, when science became a social factor, and medicine and pharmacy assumed the positions they have maintained ever since. What better motto could the pharmacist of to-day adopt than the words which an ancient writer put into the mouth of Apollo:

Opiferque per orbem dicor (6).

TRANSLATIONS OF QUOTATIONS IN THE TEXT.

(1) "Who knew all the poisons that the wide earth nourishes."

(2) "You, a workshop of Colchian poisons, are always working against me until I, burned to ashes, shall become the sport of the saucy winds."

(3) "What sorceress, what enchantress with Thessalian drugs, what god can release you?"

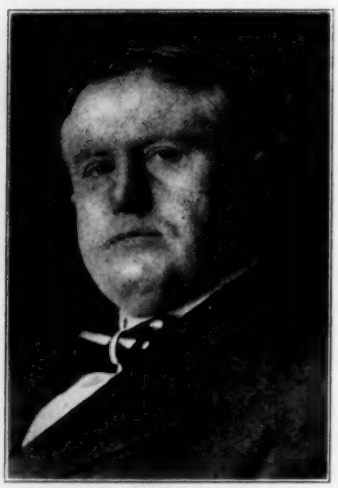
(4) "Thessalian witches follow the camp and with their native poisons pollute the light of the moon."

(5) "Thieves and vultures disturb me less than those knaves who, by means of incantations and poisonous potions, lead astray the human mind."

(6) "Throughout the world I am spoken of as a helper."

O. HENRY.

The origin of the pen name "O. Henry" is not definitely known, at least not generally; it has been said that he adopted this name from a text reference relating to Hydrocyanic Acid in the U. S. Dispensatory; others state that he picked the name from New Orleans papers. The late H. L. Carleton, for many years manager of Morley Brothers, Austin, Texas, said he did not know until years after that William S. Porter and O. Henry were the same individual. It is desired to bring in a few lines from a letter of the latter to his mother-in-law, Mrs. Roach, because they confirm this writer's belief in the innocence of the former of that charge.



O. HENRY.

"I feel very deeply the forbearance and long suffering kindness shown by your note, and thank you much for sending the things. Right here I want to state solemnly to you that in spite of the jury's verdict I am absolutely innocent of wrong doing in that bank matter, except so far as foolishly keeping a position that I could not successfully fill."

Dr. George W. Willard, of the penitentiary in which O. Henry served blame-

lessly, became a friend and admirer of the short story writer. He said much of him and always conveyed his high regard and esteem; a paragraph from "O. Henry Biography" will have to suffice:

> "He was the last man in the world you would pick for a crook. Toward everyone he was quiet, reserved, almost taciturn. He seldom spoke unless in answer. He never told me of his hopes, his aims, his family, his crime, his views of life, his writing; in fact, he spoke of little save the details of his pharmaceutical work in which he was exceptionally careful and efficient. The chief means by which I judged his character was by the way he acted and by one or two little incidents which brought out the man's courage and faithfulness."

The last recorded words of O. Henry were "Turn up the lights; I don't want to go home in the dark."

Edmunds Travis of Houston, Texas, who has written and added to the fund of authentic information about O. Henry, has granted permission to the editor to publish the following in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, or in any way that he would like. As he believes the matter is of interest to the readers, it is printed here, and thanks are conveyed to Mr. Travis for the permission given.

It may be stated, according to Mr. Travis, that O. Henry's letters of recommendation from Greensboro were reproduced in an edition of his works, with the erroneous statement that he brought the letters with him when he came to Texas. The dates on the letters refute that statement. Both letters are dated May 26, 1884, two years after O. Henry came to Texas and two months after his arrival in Austin. What happened was that O. Henry sent back for the letters when he sought a job in Austin. The following is from the communication of Mr. Travis:

"Late in the Spring of 1884, a young man named William S. Porter applied for a position in Morley Brothers' wholesale and retail drug store in Austin, Texas. He had arrived in Austin about two months earlier from a range in La Salle county, Texas, but his home town was Greensboro, North Carolina, and he presented two letters of recommendation from that place. One of these, signed by four physicians of Greensboro, including Dr. J. H. Hall, an ex-president of the North Carolina Medical Association, commended Porter both as a druggist and a citizen. The other, signed by J. N. Nelson, clerk of the court of the county in which Greensboro is located, declared the bearer an A No. 1 druggist and a very popular young man among his friends.

"Porter had learned what he knew about pharmacy in a drug store in Greensboro conducted by his uncle, W. C. Porter. It was while clerking there that he made some of the earliest of those sketches and cartoons which caused his friends to predict a brilliant future for him as an artist. That he was, in fact, a fairly good druggist is proved not only by his letters of recommendation but by his familiar handling of pharmaceutical terms in some of the stories for which he is now remembered.

"His pleasing personality, as well as his letters and his connections in Austin, helped him to get the place he sought with Morley Brothers. It was the first position he held in Austin and he retained it only a few months. So far as available information shows, he gave satisfaction and left the Morleys only because he had another position in view. His next employment was as a clerk and bookkeeper in a

real estate office and from that he went to the General Land Office of Texas when his friend, R. M. Hall, became Land Commissioner.

"At the period of his employment by Morley Brothers, Will Porter—afterward known throughout his own and many other countries as O. Henry—was between 21 and 22 years of age. He was of short stature—about 5 feet, six inches—slender, sandy-haired and had hazel eyes. A fairly good singer and performer on the guitar, he was fond of harmonizing with a few of his friends at their homes or joining them in serenades. He liked people and was accounted a good mixer, despite a habit of reticence which made him appear somewhat shy. His outstanding talent, in the judgment of those who then knew him, was his ability as a cartoonist. No one suspected that he was to become world famous as a writer of short stories—not even O. Henry himself.

"It was his knowedge of drugs which enabled Porter to acquire a special status in prison when, after his years in the land office and other years as a bank clerk and teller, he was given a federal sentence on a charge, involving National bank funds, of which he always declared himself innocent. Asked at the Ohio State prison, where his sentence was served, what he could do, he proclaimed himself a trained druggist and was placed in the hospital as night drug clerk. In this capacity, he attended the prison physicians on their calls and made calls alone at certain hours of the night.

"Among the stories told of his prison life is one that credits him with bringing about the speedy recovery of a warden who had been given too much of a medicine containing a solution of arsenic. The dose, it is said, had been measured out by another "trusty," who became alarmed when the warden showed signs of violent illness, and sought Porter's aid.

"The prison period of O. Henry's activities as a drug clerk, lasted above two years. It ended in October 1900, when he became a bookkeeper in the steward's office. By the time he left prison, he was earning a fair income as a writer and writing was his profession throughout the remaining years of his life.

"It is an odd fact that the only reference made by O. Henry to his life in Austin, in the only interview he ever granted anyone seeking facts about him for publication, was a brief statement that he had worked in a drug store there. He lived in Austin from 1884 to 1896 and again from 1897 to 1898. But, in this interview, all he had to say about the capital city of Texas was that he had been employed in a drug store there and had given up because he had to draw soda water.

"That whole curious interview, accepted as a basis for biographic sketches at the time, was a bit of mystification. O. Henry was known to but a handful of people as Will Porter. He did not wish to have his sad history revealed; did not wish to talk about himself at all. Therefore, he gave the interviewer such an account as might satisfy the latter's demands without throwing overmuch light on O. Henry's past. His mention of the fact that he had been a drug clerk in Austin may be taken as indicating that the period of his employment by Morley Brothers was one to which he could look back with only pleasant recollections."

William Sydney Porter was born in Greensboro, N. C., September 11, 1862; died in New York City, June 5, 1910.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor will also undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

SHALL THE LAW RESTRICT THE SALE OF MEDICINES?

BY PAUL C. OLSEN.

The obvious answer to the question which is the title of this article is in the affirmative. But once having approved the idea in principle its execution becomes a complex problem which is particularly difficult to understand by a person who is not familiar with the peculiar inter-relationships of the business and professional problems of pharmacy.

One well-known reaction to suggestions that the sale of medicines should be restricted to registered pharmacists is this. "If there is one class of retailers which has branched out into unrelated lines of business," says the objector, "those retailers are the retail druggists."

While it is true that some retail druggists, with a possible selfish motive, would like to have the sale of all medicines restricted to drug stores now, they probably realize that, under present-day conditions, little legal assistance can be expected for reasons stated above.

The only possible justification for the legal restriction of the sale of medicines to drug stores is the necessity of protecting public health.

In support of this contention instances are cited repeatedly of dangerous drugs and chemicals being dispensed by people who have no training in pharmacy and, consequently, no knowledge of the character and use of these goods.

Of course, personally, I am heartily in sympathy with any movement to put and keep the sales of dangerous medicines, drugs and chemicals in the hands of people who know what they are selling and what purposes are served by the preparations they sell.

I am pointing out here merely that any complaint about other stores taking business away from drug stores will receive little consideration by legislatures unless it is made plainly evident to these legislatures at the same time that the protection of the health and, indeed, the very lives of people depends upon such restrictions.

It is incumbent upon those sincerely interested in the progress of pharmacy, as a result of this situation, to limit their appeals for privileges and rights to those items on which the dangers of indiscriminate sales can be made plainly evident to lay legislators. To say, for instance, that the sale of castor oil should be restricted to drug stores is not going to win a very sympathetic ear unless, at the

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same time, strong clinical evidence is presented in a forceful way to show untoward results from the indiscriminate sale of castor oil.

Another aspect of the problem of securing, to protect public health, legal restrictions upon the sale of dangerous medicines, drugs and chemicals is the following. Granting the need for this protection, will people get such protection if the sales of these goods are confined to registered pharmacists?

With due respect to the thousands of ably and expertly conducted pharmacies throughout the United States, I am sure that to-day there is not in every drug store complete assurance of such protection. Furthermore, I feel sure that the proprietors of these ably and expertly conducted pharmacies would be the first to agree that there are drug stores in this country which cannot be trusted to render the professional services of pharmacy in a dependable way. They are deeply concerned about this condition, and rightly so, for the same reason that responsible physicians are exercised about the activities of their malpracticing brethren.

There are deficiencies, which it is regrettable to say are not very difficult to find, resulting from a number of causes. One is the sale of dangerous medicines, drugs and chemicals by unqualified persons without the supervision of registered pharmacists.

Another cause is the sale of drugs therapeutically useless. This may be the result of carelessness or laziness or the result, in some instances, of efforts to sell merchandise which is worthless but which the owner prefers to sell rather than throw it out and take a loss upon it.

Another way in which some fail to render to their customers the proper professional service and protection is inexpert dispensing and compounding. This may result from a lack of knowledge, a lack of skill or carelessness. Persons not familiar with the practice of pharmacy, frequently criticize the requirement that a person must complete a three- or four-year course in pharmacy and have some years of practical experience in addition before he can become a registered pharmacist. Also some students of pharmacy resent the time and expense of obtaining training in a profession which they believe they will have little opportunity to practice in their stores. It will be admitted, I believe, that there still are pharmacists who are unable to perform competently the professional demands which are made upon them. As a result, some physicians will for all or some of their prescriptions direct patients to certain pharmacies, where they feel assured, these prescriptions will have the attention or supervision of qualified pharmacists. Similarly, some people, although they are increasingly price conscious of the more popular packaged, identified merchandise, travel long distances out of their way to make sick-room and emergency purchases at drug stores at which they are assured of competent professional service.

I am firmly of the belief that for the protection of public health the sales of many thousands of commonly used medicines, drugs and chemicals should be restricted to registered pharmacists. But I am likewise firmly of the belief that efforts to secure legal protection for this ideal will be seriously handicapped until there is more general assurance that all persons licensed to practice pharmacy are willing and able to render the professional service and protection which rightfully should be entrusted exclusively to pharmacists.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

This second paper on the "Teaching of Incompatibilities" presents the subject from a different point of view than that taken by Professor Husa in the recent paper in this Department. We are glad to present views of different teachers of important subjects in this Department of the JOURNAL and we welcome contributions from any teacher of pharmacy on any subject in the pharmaceutical curriculum. In fact, if space permitted, we would be glad to conduct in this Department an open forum on pharmaceutical teaching.—C. B. JORDAN, *Editor*.

WHY TEACH BOTANY IN PHARMACY SCHOOLS?

Because—Botany Is a Cultural Subject.

BY C. J. ZUFALL.*

Much attention is given to the study of "The Arts" dealing with man-made subjects. More profound and broadening is the study of the plants made by the Creator.

Can one's education be complete without some knowledge of the wonderful structures all around him, the plants?

How much more does travel mean to one who knows about the changing vegetation as he passes from one zone to another. To the student of botany the vegetation of the moist hot zone is not a tropical "jungle" but the richest of all nature's gardens in which grow the magnificent palms and ferns and the gorgeous orchids which hang high in the trees.

Who wants to be the man referred to in the poet's lines when he wrote:

> "A primrose by the river brim;
> A yellow primrose was to him,
> And it was nothing more."

What if all of us could have the feeling of Tennyson as he wrote:

> "Flower in the crannied wall,
> I pluck you out of the crannies,
> I hold you here, root and all, in my hand,
> Little flower—but if I could understand
> What you are, root and all, and all in all,
> I should know what God and man is."

To the botanist the dandelion is not a weed simply to be dug out of the lawn, but a flower of most exquisite design and beauty.

To the golf player grass is simply a velvety carpet for his green, but under the microscope the botanist sees the flower of the grass as a very delicate and attractive picture.

To the angler the pond scum is simply a nasty mass of "something" which clings to his line and clutters up his bait, but the botanist puts it under the microscope and sees the wonderful spirogyra. The angler may be bothered by the dense growth of dodder on the water plants as merely an entanglement to impede his wading, but the angling botanist sees the dodder as an interesting plant which

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loses its independence shortly after germination and becomes a parasite, forming the large yellow patches which stand out so prominently on the landscape.

Many things all about us are mysterious until the student of plants explains them. The north side of a tree is green simply because the sun permits enough moisture to remain there to support the millions of microscopic green algæ.

The fact that a pasture or lawn is cooler than the barren soil adjacent to it is well known to the ordinary observer but the why is explained by the student of plants, who has learned that the millions of blades of grass give off enormous quantities of water vapor and this act accounts for the lower temperature.

Modern physicians may not be interested in botany, but it got a hold on such physicians as Asa Gray, John Clayton, John Torrey, John Bartram and George Engelmann and compelled them to give up their practice so that they could give their entire time to plant study and thereby become America's foremost botanists.

Likewise in pharmacy. Many of our graduates either go directly into botanical fields or take it up some time later, undoubtedly because of the stimulus given by the instructors.

Because—Botany can be taught in such a manner that it will *train the mind* to think "in a straight line" just as effectively as mathematics will.

Of course, the study of plants might be simply the learning of the parts of a plant, but in plant histology, plant physiology, genetics or in any phase of botany, reasoning is absolutely necessary and the subject is "built up" in just as systematic a manner as algebra or geometry. We might claim that botany has a distinct advantage over algebra in the fact that concrete objects are used.

Because—Botany is *interesting* and *attractive* if taught in an interesting manner. Some of our students have an aversion to botany when they first come to us because they state that it has been a drudge to them. Botany need not be a drudge. The subject can be humanized in our schools of pharmacy by connecting it up with medicine and using medicinal plants for our laboratory material.

One big mistake made in botany, as in many other subjects, is in learning about plants instead of learning plants.

Because—Many *practical items* in pharmacy can be and should be learned in the botany class.

In the study of enzyme action in plants the botany student learns how the germinating seed must secrete the amylolytic enzymes which convert the insoluble carbohydrates into the soluble form so it can be used in growth. Knowing this the pharmacy student understands why malt is a medicinal product, while the barley grain from which it is prepared is not. Malt contains the amylolytic enzyme and also soluble and easily digested carbohydrates.

In this connection the source of the well-known Taka-diastase is understood after the student of botany has learned how molds secrete the diastase in order to predigest starches for their use. Taka-diastase is prepared by simply removing it from a culture of a certain species of mold.

Alcoholic fermentation is another illustration of enzymatic action studied in connection with the metabolism of the yeast plant. A study of this kind makes both botany and chemistry more interesting, especially to pharmacy students.

Just what toxins and antitoxins are and what they are used for can be taught to beginners in botany while studying bacteria as one group of the fungi. To be

sure there will be much more to learn about bacteria in bacteriology, but to humanize botany by the use of such subjects is bound to keep the students' attention.

Spray materials can be handled more intelligently by the pharmacist who has studied botany. Many pharmacists understand the proper uses of the sprays from practical experience in their own gardens and orchards. Such men win the confidence of their customers.

Because—The subject of pharmacognosy cannot be taught effectively unless preceded by a course in botany. This is self-evident, since pharmacognosy is the study of plant parts used in medicine.

Because—Organic Chemistry will be better understood after a course in botany. Alcohols, aldehydes, esters, cyanogen compounds, sugars, starches, gums, cellulose, alkaloids, glucosides, fats, waxes, plant pigments, enzymes and vitamins are all associated with plant metabolism, which indicates a need for plant study. Cellulose alone is a life-time study for both a botanist and a chemist.

The plant cell can secrete so many catalytic agents and with them synthesize so many compounds that a chemist can take a great many lessons from it.

Because—Plant Chemistry, which many pharmacy students later pursue, must be preceded by a course in botany. It seems to me that at the present time, with the work going on with vitamins, irradiation, bacterial fermentation, cellulose, etc., that the man thoroughly trained in both chemistry and botany has tools of far-reaching effect.

Interior of Lion Pharmacy, Stockholm. Courtesy of William Mair and the *Journal and Pharmacist*. The pharmacy was founded in the 15th century—a history and sketch will be given in a succeeding issue. It is modern, the leading pharmacy of Stockholm; ten dispensing counters are fully equipped for the corresponding number of pharmacists at work.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

Article III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

BALTIMORE.

A large and enthusiastic attendance marked the May assembly of the Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, which was held at the Emerson Hotel on Friday, April 24, 1931. A dinner preceded the meeting, which was featured by a debate between the teams of the School of Pharmacy, Duquesne University, Pittsburgh, Pa., and the School of Pharmacy of the University of Maryland.

The subject discussed was:

"Resolved the Chain Store System Is Detrimental to the Best Interests of the Community."

Mr. McClinton and Miss Borda of Duquesne presented the arguments for the affirmative, while Messrs. Elsberg and Moses of Maryland, defended the negative position. The data of each group had been judiciously selected and correlated, and were presented so convincingly that it was with difficulty that a decision favoring Duquesne was rendered. The judges were C. Morris Harrison and J. Davis Donovan, members of the Baltimore Bar, and Professor Saunders, director of Debating at the Baltimore City College.

CHICAGO.

The 197th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the University of Illinois School of Pharmacy on the evening of April 21st. The meeting was called to order by Vice-President Terry, who, in the absence of President Hynes, conducted the meeting.

Dean Day introduced the guest speaker of the evening, Dr. Edward Kremers, director of the Course in Pharmacy of the University of Wisconsin, who talked on "Aspects of American Pharmaceutical History."

Mention was made of the fact that pharmacists contributed much to American chemistry. The historical side of his talk brought out the fact that the first white settler in New France was an apothecary named Hébert, who came over with Champlain. Also, Governor John Winthrop was an apothecary and medical advisor to the colonists.

Most of the drugs used in the early days were imported from England and were official in the B. P. Even after the Revolutionary War the United States still depended upon England for its medicinal agents.

The first American Materia Medica was written after the war by a surgeon, Schoepf, who came over with the Hessian soldiers and then settled here. The Philadelphia College of Pharmacy was a sort of guild, organized by the pharmacists of that city to protect themselves.

At the conclusion of Dr. Kremer's address, Dr. Fantus expressed his appreciation of it and commented on how few people really thought about the subject. He also asked for advice on the welfare of the U. S. P. and N. F. and about the history of important preparations, and suggested that the history be deposited some place where it would not be forgotten or become lost. He told how Labarraque's solution came into use.

Dean Day stated that John Uri Lloyd was writing the history of the U. S. P. preparations, but as to how much work had been completed, he could not say.

Mrs. H. C. Christensen, in the absence of President Christensen, greeted Dr. Kremers for the A. PH. A.

Professor Terry then suggested that the papers and memoirs of Dr. Kremers be collected and preserved.

Dr. Fantus then made the following resolution:

"WHEREAS, It is generally difficult and often impossible to obtain access to the history of the various preparations of the National Formulary,

"WHEREAS, It is important most especially for the revision and improvement of the formulas to have available such historic data,

"*Resolved*, That it is the sense of this meeting that the AMERICAN PHARMACEUTICAL ASSOCIATION be requested to set aside annually a sum of $1000 for such historic research and publication."

The resolution was seconded by Wm. Gray, and endorsed by Professor Gathercoal, who told about the cost of publication of the N. F. A vote on the resolution was called for by Vice-President Terry and carried.

The meeting was concluded by giving Dr. Kremers a rising vote of thanks.

LEWIS E. MARTIN, *Secretary*.

NEW YORK.

The April meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held, in conjunction with the Academy of Pharmacy, on Monday, the 13th, at the New York Academy of Medicine. There was an attendance of about 250.

The meeting had been arranged for the purpose of discussing problems of mutual interest to physicians and pharmacists; notices had appeared in the medical and pharmaceutical press of the City and the various associations of physicians and pharmacists had been circularized.

President Robert S. Lehman, of the Academy of Pharmacy, called the meeting to order at 8:30 P.M. and after a word of welcome, introduced President Robert P. Fischelis, of the New York Branch of the A. PH. A., who occupied the chair for the first part of the program, which was devoted to the expression of views by physicians. He introduced Dr. Horatio C. Wood, Jr., editor of the United States Dispensatory and professor of Materia Medica at the University of Pennsylvania and the Philadelphia College of Pharmacy and Science; Dr. Wood delivered an address entitled, "What the Modern Physician Should Expect of the Modern Pharmacist."

Dr. Wood prefaced his remarks by saying that he esteemed it a privilege to take part in the evening's discussion because he was sincerely interested in both branches of the medical profession, and held that medicine and pharmacy were essentially one; they have the same purpose of relieving human suffering and if some people to-day are forgetting this, the truth of the statement is not altered.

He said that medicine and pharmacy were mutually dependent each on the other for its existence; there are druggists to-day who ignorantly say, "I don't need the doctor, I can still make a living selling soda-water and sandwiches;" already to-day rumbles in the legislatures presage the coming of a storm which will wreck these men who call themselves pharmacists. There are physicians who claim that they do not need the pharmacist while there are physicians' supply houses and proprietary medicines; but, if there were no pharmacists, who could make the ready-made remedies; who, among physicians, is qualified to go out and supply himself with herbs and medicines?

He felt that there was a very close relationship between medicine and pharmacy; in the war on disease, the doctor is the Commander-in-Chief and he has handed over to the pharmacist the Service of Supplies. What should the modern physician expect of the modern pharmacist?

(1) *Loyal Coöperation*—an assistant who is not interested in seeing the success of his chief is worse than no assistant at all.

(2) *Honesty*—one of the saddest lacks of the pharmaceutical profession is the failure to visualize the sick and suffering waiting on the pharmacist's ministry; he does not realize how often health or life itself is being weighed in the pharmaceutical balance.

(3) *Ability*—there is no greater nuisance than the man desiring to help but without the ability; the physician expects that the pharmacist shall not only have the spirit of willingness to serve but shall have the requisite knowledge of the art and science of his calling. Judging by the appearance of some drug stores of to-day, where the physician sees 90% of the space taken up with general merchandise, can

he be blamed if he thinks that the compounding of prescriptions does not play a big part in the drug store and so mistrusts the ability of the pharmacist to compound prescriptions? The education of the pharmacist is fully as sufficient for his profession as is the education of the physician.

Directing his remarks to the physicians present, Dr. Wood said that that man gets the best service from his assistants who shows the proper consideration for their rights; there are poor physicians as well as poor pharmacists. If the physician writes prescriptions for ready-made preparations, how does he expect the pharmacist to retain, much less improve, his technique in the art of compounding prescriptions? If medicine and pharmacy work together in harmony, there will be for both professions and for the community at large, a great measure of success; if medicine and pharmacy move in opposite directions, the dissolution of each is the only result.

Dr. Fischelis next introduced Dr. M. O. Magid, president of the Bronx County Alliance, who in his discussion of Dr. Wood's paper, spoke on "The Relation of the Pharmacist to the Medical Man as a Medical Man Sees It."

Dr. Magid said that he had been very pleased to listen to Dr. Wood, whose opinions on the present situation were virtually his own; but that he would try to place the blame not where Dr. Wood placed it, but where it ought to go. Twenty-five years ago there was harmony between physicians and pharmacists, and he wished that it existed to-day; the physician was not so much to blame as the pharmacist. A modern pharmacist, as Dr. Wood said, often stocks up his place with merchandise not pharmaceutical, whereas a modern physician, though he may be an old-timer, tries to keep abreast of the times by attendance at clinics, reading medical literature, etc.

The public has been taught by manufacturing drug houses, by means of advertisements, to deal with the pharmacist who allows his store to be a display house for certain proprietaries; by recommending these he tries to practice medicine under cover, to usurp the place of the physician; he does not think of the patient's safety and comfort, but of his cash register. The degree of Doctor of Pharmacy does not license him to practice medicine, nor to assume to treat the patient nor to interpret clinical reports. The public expects that leaders of the medical profession should deal ethically with them, protect them from quackery and charlatanism and give of the latest and best in the interests of public health; the pharmacist should be an adjunct in the treatment of the sick, he should be honest and dispense genuine ingredients, should be thoroughly competent, ethical with his colleagues, alert and not meddlesome; he should discharge his duties by refusing to counter-prescribe, by refraining from attempts at diagnosis and instead, by sending the patient to the physician.

What are some of the factors that have brought pharmacy to its present status? The pharmacist is the victim of a machine age, of "big business" and its large financial resources, of modern advertising methods, of advances in medicine with changes in methods of treatment (intravenous medication, etc.), of changes in policy in medical education (little or no pharmacology and materia medica), of lack of confidence by the medical profession and by the public in the average pharmacy.

How may the relations be improved between the public and the pharmacist and the physician? The remedy is public education in matters of health and hygiene, also a change in the curriculum of students in pharmacy and medicine. The medical and pharmaceutical professions should together plan a campaign of lectures and demonstrations for the public; little has been done to educate the public by either profession; the public should be enlightened on all matters pertaining to health and hygiene so that it will not be tempted by the alluring advertisements of the patent medicine makers. With regard to the education of medical students, the profession should see to it that they receive more instruction in pharmacology and prescription writing. For the future of pharmacy, the student body should be chosen from men and women of high ethical standards.

How may the confidence and better relations between the two professions be restored? The remedy lies with the profession of pharmacy; let its members abandon counter-prescribing, stop treatments, eliminate interpretations of clinical laboratory reports and guarantee that they will not substitute or omit ingredients from prescriptions; then will the medical profession do all within its power to be a real friend and colleague to the pharmacist. The pharmacists themselves can bring about this favorable relation by establishing ethical standards through a committee which will form a code of ethics to which the pharmacists must adhere

just as the medical profession must adhere to its code of ethics.

The next speaker was Dr. Howard Lilienthal, Senior Surgeon of Mount Sinai Hospital; he said that, before coming to the meeting, he had consulted his dictionary which told him that pharmacy was a branch of medicine; it seemed to him, that if the druggist were merely practicing one branch, then the physician should have greater sympathy with him. He thought that druggists should not trespass on a physician's field, but that if they undertook laboratory or X-ray work, they should employ technicians skilled in each branch.

In regard to proprietaries, he felt that the pharmacist's own preparations were proprietaries and he saw no difference between a hand-lotion made by the pharmacist and one put up by a manufacturer. He held that all medicines should be prescribed in writing, so that in any untoward event, the ingredients used can be traced to their source.

He suggested that pharmacists should not recommend doctors to patients, but in cases where it becomes necessary, it should not be done with a commercial end, known as "fee splitting," in view. With reference to physicians recommending drug stores, he said that, in the interest of fair-play, this should not be done, though a physician has a right to send a patient to a pharmacy where he is sure the prescriptions will be correctly compounded.

Dr. A. B. Hirsch, editor of the *New York Medical Week*, was now introduced by Dr. Fischelis; he referred to a well-organized campaign against physicians, articles appearing regularly in various magazines dealing with the supposed misdeeds of the medical profession; he said that there was an urgent need for active replies to put a stop to this lying campaign. He spoke of the growth of new cults and the way in which they seek legal authorization—the chiropractors, the osteopaths and the physio-therapists; these men are often illiterate and have a poor professional training, if any. During the past session of the State Legislature, a Chiropractic Bill was passed by the Assembly; this shows the influence wielded by the chiropractors and emphasizes the need for the medical profession to be active in trying to prevent the passing of such bills; pharmacists should be interested in supporting the physicians on this point, since chiropractors and members of other irregular healing cults claim that their patients can dispense with the use of drugs. He suggested that physicians and pharmacists should work together in legislative matters, and that pharmacists could help in a very practical way by having petitions in their stores and getting as many signatures as possible; these, since they represent votes, would carry great weight with the members of the legislature.

The chair was now taken over by Mr. Lehman and he presented Dr. H. V. Arny, dean of the College of Pharmacy, Columbia University, who delivered a paper entitled "The Physician and the Pharmacist as Co-Workers."

Dr. Arny pointed out that, from ancient times, the apothecary had been the physician's assistant; he said that, in these days, too much was heard about the commercial side of pharmacy, but in this physicians had no interest and so it was not of that which he would speak to-night, but of coöperation between the physician and the pharmacist.

This can exist only when each of these practitioners is fired with the same primal motive; the desire to bring relief to the suffering patient. There can be no coöperation when the physician is a "dispensing doctor," is unethical, is a therapeutic nihilist or is either too ignorant of therapeutics or too indolent to write an orderly prescription. There can be no cooperation when the pharmacist is a "counter prescriber," is more concerned in making sales than in performing professional service, is uninterested in medical progress or is too ignorant to be able to advise physicians, or too indolent to properly compound prescriptions. There can be coöperation when the physician and the pharmacist feel that they are co-workers in the fight against disease, when each respects the other's special knowledge and qualifications, when mutual exchange of views will produce the satisfactory remedy for the particular patient upon whom both the physician and the pharmacist are at the moment concentrating their attention. If this coöperation were clearly understood and honestly acted upon, friction between the physician and the pharmacist would cease and a better state of medical practice would be obtained. How can such coöperation be brought about? It can and will and is actually being brought about when the physician and the pharmacist coöperate in the treatment of disease by the administration of medicines.

The professional man is one to whom first things are first and in pharmacy the "first thing" is the prescription department; this does not necessitate the conducting of a strictly

prescription pharmacy; a number of side-lines are entirely proper adjuncts to pharmacy and these only become objectionable when an improper emphasis is placed upon them. The physician has always at hand a number of methods whereby he can measure the ability of the individual pharmacist. Is the pharmacist an educated man? Does he give his personal attention to his business? Is he more interested in his prescription department than in any other part of his business? Is this interest manifested by proper location, equipment and advertising of his prescription department? Is he sufficiently well-read to be able to give expert and practical advice as to newer materia medica and recent advances in the pharmacal practice? Is he honorable in his business transactions? If all of these questions can be answered in the affirmative, then the physician has found a worthy pharmaceutical co-laborer.

Every physician in his quiet moments must realize that the patient is not best served by the handing out of such tablets that chance to be in the doctor's stock closet or by being given prescription specialties of unknown composition, the "ethical pharmaceutical" of today which becomes the largely advertised "patent medicine" of to-morrow. The thinking physician realizes that the ideal administration of medicine is by means of the carefully thought out prescription, by the prescribing of the hundreds of elegant and effective preparations found on the pages of the Pharmacopœia and of the National Formulary. Diagnosis is not the ultimate aim of the physician. The patient has a right to demand of the physician the same skill and thought in providing effective remedial agencies, as the modern medical practitioner employs in locating the cause of the malady.

Dr. Arny said that what he considered the primal factor necessary to develop the professional coöperation between the physician and the pharmacist was the organization of an Institute of Prescriptionists or a Guild of Apothecaries, the members of which should be limited to those pharmacists who—

1. Give their prescription departments their first interest and loyalty.

2. Have the education, training and principles fitting them to be competent to give physicians expert advice and to furnish their patients with the finest grade of medicines in the most modern and elegant form.

3. Have broad-mindedness and public spirit sufficient to embark with their fellow pharmacists of equal standing in an enterprise destined to be of great service to the practice of medicine.

If such a national organization were effected, if physicians were supplied with prescription blanks bearing the names of Guild members in their neighborhood, if these physicians were furnished with seasonable information as to U. S. P. and N. F. preparations and with actual samples of these preparations as manufactured by Guild members, he believed that the writing of prescriptions would increase and all three human factors in the art of healing—the patient, the physician and the pharmacist—would be benefited.

Mr. Lehman then introduced Robert R. Gerstner, retail pharmacist and former president of the New York Branch of the A. PH. A. Mr. Gerstner said that he admired Dean Arny for upholding the pharmacist; the average physician wants to coöperate with the pharmacist, and the average pharmacist wants to cooperate with the physician, but often the pharmacist has neither the knowledge nor the ability and blames the physician for the lack of prescription business.

The pharmacist must coöperate with the physician more than the physician with the pharmacist; few stores keep complete files of pharmaceutical catalogs available to the physician for reference; few stores stock an adequate variety of biologicals; pharmacists should read the *Journal of the A. M. A.* and thus keep in touch with newer methods of treatment. A store that devotes its efforts to the soda fountain business cannot devote itself successfully to a prescription business; the former is not to be recommended as it is not conducive to ethical pharmacy. When a person asks a pharmacist to refer him to a doctor, the pharmacist should write down the names of three physicians for him and thus free himself from the suspicion of "fee-splitting."

Mr. Gerstner held that in giving physicians large discounts pharmacists were, in a way, bribing them. If a pharmacist opens a laboratory, he will hire trained chemists and bacteriologists to do the work, whereas a doctor, in his office practice, sometimes employs a very cheap technician to carry out urine analysis, blood tests, etc. Doctors should put a stop to "fee-splitting" between their secretaries or nurses in charge of their offices and certain

pharmacists; they should not attempt to foretell to patients the price of prescriptions, nor should they tell them "to go to the drug store for this or that" as this is only inducive of self-medication by the public. It would be a help to the pharmacist if the physician would not use, in the case of external preparations, the phrase "use as directed," because the patient often questions the pharmacist on the point to see if he knows his business; frequently the preparation can be used in a variety of ways and the pharmacist is ignorant of the particular way in which the doctor wants it to be used for the case in question.

Mr. Gerstner felt that the pharmacist is a professional man and that if he wishes to be considered as such he must conduct his pharmacy ethically.

The next speaker was Dr. J. Leon Lascoff, retail pharmacist and president of the New York State Board of Pharmacy. He, first, referred to two previous joint meetings of physicians and pharmacists held under the auspices of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION; these had been a clearing house of problems arising in the relationship of physician, pharmacist and patient.

Dr. Lascoff said that, at the present time, the calls of so many manufacturers' detail men on physicians had forced the pharmacist to stock his shelves with numerous proprietaries, a large number of which were similar in formula and differed only in name; it was unfortunate that the average pharmacist was not in a position to send a representative to the doctor's office, as there were very few, if any, combinations manufactured under patented names, whose therapeutic value the physician could not duplicate in formulas of his own, to say nothing of those given in the U. S. P., N. F. and A. PH. A. Recipe Book. He did not think it to the best interest of physicians for them to prescribe proprietaries in "original bottles" as in this way patients often found out what they were taking; he felt that if the addition of a small quantity of some tincture or elixir to the proprietary were prescribed, the patient would consider the prescription as such rather than as a "patent medicine." The prescribing of proprietaries in original containers leads to self-medication, and recommendation to friends and frequently promiscuous use of habit-forming drugs.

Dr. Lascoff referred to Dr. Arny's paper and said that there was no doubt as to the ability of the pharmacist, it was there and waiting to be used; pharmacists to-day were receiving 100% better training than in the past. He directed the attention of the audience to the display of pharmaceutical products which he had arranged, as chairman of the U. S. P. and N. F. Propaganda Committee of the New York State Pharmaceutical Association; the display included keratin-coated pills, salol-coated capsules, wafers, ampuls, sterile solutions, suppositories and U. S. P. and N. F. galenicals; all of these could be put up by any pharmacist. Standard formulas and legal requirements insure uniformity and all ingredients are known; the State Board of Pharmacy is seeing to it that these preparations, as well as prescriptions, are put up according to standard.

He thought that Dr. Arny's idea of the Institute of Prescriptionists was a splendid one, and suggested the formation of a committee of physicians and pharmacists to find a remedy to improve conditions as they exist to-day. Then will the physician be assured of a high type of coöperation, the good pharmacist will be encouraged and, most important of all, the patient will benefit.

Dr. Jacob Diner, dean of the Fordham College of Pharmacy and former president of the Academy of Pharmacy, was then introduced by Mr. Lehman. Dr. Diner said that it was the duty of the physician to know what to prescribe, and of the pharmacist to know how it should be compounded; he criticized the pharmacists of to-day for throwing away mortars and pestles and depending on manufacturers for the making of galenicals; a pharmacist making his galenicals would be putting on his shelf preparations with his own personal guarantee. He thought that medical colleges should be censured for devoting such a meagre portion of their course to Materia Medica and Pharmacy. He felt that there should be more frequent joint meetings between physicians and pharmacists, as he was certain that such meetings were of great benefit to both professions.

Mr. Lehman next presented Charles E. Heimerzheim, retail pharmacist and secretary of the Kings County Pharmaceutical Society, who spoke on the subject of "How Physicians Respond to U. S. P. and N. F. Propaganda."

He told how his Society, 25 years ago, had started an active U. S. P. and N. F. Propaganda among Brooklyn physicians to combat the prescribing of Patent and Proprietary

Medicines; the Committee in charge of the work began by mailing letters to the doctors and pointing out the four following advantages of prescribing U. S. P. and N. F. preparations:

1. The Pure Food and Drug Act made the U. S. P. and N. F. Official Standards.
2. These books are revised every 10 years by a committee consisting of doctors, pharmacists and scientists.
3. Should the formulas be changed the doctor becomes aware of the fact; this is not usually the case with patent medicines.
4. The patient soon finds out the name of a patent or proprietary medicine and may recommend it to a neighbor for self-medication, or he may condemn the doctor for prescribing a patent medicine.

Later, a doctor was secured as a detail man to call on physicians so as to carry out the propaganda more effectively; he was directed not to attempt to teach the physician how to write a prescription as he would undoubtedly resent this; he was supplied with samples, and by displaying them he soon discovered which ones interested the doctor and he could then concentrate his talk on these; it was considered he had done good work if he succeeded in getting the doctor to prescribe one or two of them. Unfortunately, owing to the war, it was necessary to dispense with the detail man. The mailing of letters, etc., was resumed, and the N. A. R. D. booklets entitled "Important Preparations of the U. S. P. and N. F." were distributed; Get-Together Meetings between physicians and pharmacists were held in Brooklyn and were considered very successful.

The effect of the propaganda was determined by collecting data from a number of members of the Society, and to ascertain specific results, efforts were often concentrated on one particular preparation for 4 or 6 months; the prescribing of a number of preparations was traced directly to the committee's activities in this direction.

Mr. Heimerzheim said that many letters had been received from doctors and also hundreds of requests for booklets; he read a few letters, and told how one doctor said he regretted he had not received a good deal of this information sooner, while another admitted with shame that he possessed neither a U. S. P. nor an N. F.

He concluded by saying that he was sure a propaganda properly conducted with the aid of a detail man, whom he considered indispensable, would prove a great success; he hoped that the pharmacists of Greater New York would one day subscribe liberally to a real live U. S. P. and N. F. Propaganda.

The meeting was now opened for discussion and Dr. Magid rose to say that he was arranging a joint meeting of physicians and dentists next November and would be glad to help in any way possible in planning another Physician-Pharmacist Meeting in Greater New York.

President L. S. Williams, of the Maryland Pharmaceutical Association, said that he had traveled up from Baltimore that morning so as to attend this meeting; he thought that there were to-day two types of pharmacies—some were merely department stores and should not be classed as pharmacies, while some still looked like pharmacies and functioned as such. In regard to U. S. P. and N. F. propaganda, he said that he had been carrying this out himself over a long period; his method was to send to physicians every other week a one-ounce bottle of some preparation, together with its formula and dose; he did not feel that this was trying to tell the physician what to prescribe, but it was showing him the quality of his products. He held that propaganda work by pharmaceutical associations was a good thing, but that it was not quite as effective as that done by the individual pharmacist. He was certain that U. S. P. and N. F. propaganda would be a success if carried out systematically over the whole country. As State President he had visited most of the pharmacies in Maryland and had tried to impress upon the proprietors the importance of making their stores look like pharmacies; in this connection he had stressed the use of the show-globe, which in Maryland, by State law, can only be displayed when a registered pharmacist is in charge.

Dr. Wood, Dr. Magid, Messrs. Seley, Brodkin and Kopald took part in an animated discussion on some of the problems that had been mentioned by the various speakers.

President Fischelis said that this meeting should be the starting-point of some active and corrective measures; he suggested the holding of "Conferences of the Health Professions in Greater New York," and moved a resolution to form a committee of 2 physicians, 2 pharmacists and a professor of a College of Pharmacy to institute such conferences; this was carried.

The meeting, which had been full of interest from beginning to end, adjourned at midnight.

HERBERT C. KASSNER, *Secretary.*

NORTHERN OHIO.

The second regular meeting of the Northern Ohio Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was called to order by President Spease in the lecture room of the School of Pharmacy, March 13, 1931. The minutes of the previous meeting were read and approved.

President Spease outlined the program of the organization for the benefit of the guests present and introduced the speaker for the evening, Dr. A. F. O. Germann, chief chemist for the S. M. A. Corporation.

Dr. Germann spoke on "Infant Feeding." In the course of his talk he took up the composition of natural and synthetic milks and showed by tables the compositions of the various infant foods. Dr. Germann discussed the lactose, fat and protein of human and synthetic milks and gave his experience in the manufacture of S. M. A.

After discussion of the paper the society adjourned.

F. J. BACON, *Secretary.*

PHILADELPHIA.

The April meeting of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday, April 14, 1931, at the Philadelphia College of Pharmacy and Science.

The minutes of the March meeting were read and approved.

President Munch introduced Dr. Ellice MacDonald, Director of Cancer Research, Graduate School of Medicine, University of Pennsylvania, as the guest speaker for the evening. Dr. MacDonald chose for his subject "Cancer Research," basing his discussion upon the following outline:

"Cancer research is changing in character from microscopic study of dead cells to the study of the function and qualities of living cells. The cell is the unit of life: but the cell and its environment are one. The vital system consists of at least four parts: (1) nucleus, (2) protoplasm, (3) cell membrane, and (4) the environment, the blood and tissue juices.

"The known facts in regard to cancer are that there is a different cellular metabolism from normal, that cancer patients have undue alkalinity of the blood plasma, and that the blood of cancer patients contains an undue amount of sugar. Tumors which are virulent contain a greater amount of potassium and a less amount of calcium than normal.

"Taking these facts it is possible to remove the cancer from the experiment and error laboratory and put its study upon the basis of the scientific method and to lay down the criteria required to control cancer.

"Biochemical study of the blood in cancer has great possibilities of throwing light on the course of the disease. After all, cancer lives in the body and the blood may be considered the environmental fluid of the cells. Alternations in the environment will produce alterations in the functional activities of the cell. Cancer has so long been considered a cellular disease that we have been apt to forget that the cell and its environment are one and that no investigation of cell is completely without a study of its environment. When we say we have fish for dinner, we misstate the fact; we have had something which, when it was in its environment (the water) was fish, but, removed from there, is a dead thing. When we study the cancer cell through the microscope, we study a dead and altered thing, removed from its environment, having lost its functions and with most of its qualities destroyed.

"The study of these functions and qualities by means of the investigation of the environmental conditions, of which the blood is a great part, offers considerable promise. In such studies, it should not be forgotten, while the ideal is the discovery of the cure of cancer, that improvements of existing methods of treatment are a second duty, not less important than the ideal. Present methods of treatment of cancer are not without result when the total percentage of cures are compared with such diseases as pneumonia, etc. It is true that none of us are satisfied, because we realize that present methods are merely a bridge leading to better things. Still, if these present methods can be improved, and their value extended, it will be a great and immediate help. Of studies which may lead to that consummation devoutly to be wished for, investigation into the chemistry of the blood in cancer patients seems to be a field which has great promise of helpful results."

A rising vote of appreciation was tendered Dr. MacDonald for his splendid talk.

Chairman Slothower of the Membership Committee submitted the following names for Branch Membership: J. W. Jester, W. C. Boucsein, H. H. Crosbie, C. C. Neal, Dr. Ellis Miller, G. A. Slothower, H. H. Jones, F. R. Firebaugh, Ko Suto, E. C. Erthal and R. I.

Grantham. A motion to accept them as Branch Members was made and carried.

Proposed amendments to the By-Laws of the Philadelphia Branch, AMERICAN PHARMACEUTICAL ASSOCIATION were submitted and are as follows:

(1) In the By-Laws numbered (1) change *contributing* to *honorary*.

(2) In By-Law (3) insert after *residing in* the words *or within a radius of seventy-five miles of*

(3) In By-Law (4) change the word *contributing* to *honorary* wherever it occurs.

(4) Amend By-Law (10) by inserting the words: Every active member who shall be in arrears in the payment of annual dues for two years or more, shall be transferred to associate membership, but may regain active membership upon payment of said dues.

These proposed changes were tabled for final action to be taken during the May meeting.

Committee appointments for the ensuing year announced during the meeting are as follows:

Committee on Practical Pharmacy: Chas. T. Pickett, *Chairman;* R. T. Blackwood, Ambrose Hunsberger.

Committee on Professional Relations: Dr. John L. Minehart, *Chairman;* Dr. Wilmer Krusen, W. L. Cliffe.

Committee on Membership: G. A. Slothower, *Chairman;* E. T. Hahn, L. G. Penn, W. N. McNeary, Brua C. Goodhart, A. B. Nichols, F. H. Eby.

Committee on Entertainment: J. W. E. Harrisson, *Chairman;* Raymond Hendrickson, C. Louis Seip.

W. J. STONEBACK, *Secretary.*

PHARMACEUTICAL HISTORY IN BARCELONA.

Barcelona[1] seems to have an important part in the settlement of affairs in Spain at the present time, hence an article by Euphemia Terry in the *Pharmaecutical Journal and Pharmacist* on "An Old Hospital of Barcelona," is of interest, and is abstracted in the following. The hospital referred to is the "Hospital de la Santa Cruz," which was founded in 1229 by Canon Colon. The apothecaries of Barcelona, who maintained an age-long quarrel with some of the religious orders, seem to have had no grudge against this hospital for they maintained a pharmacy within it and presented this hospital, in 1535, with a complimentary copy of "Concordia farmacopolarum barcenonensium." This was in 1535 at about the same time that the Council of the College appointed a committee to inquire into how hospital pharmacy might be improved. The College of Apothecaries was a close corporation with strict rules, and records as far back as 1302 refer to it as a guild known as "Candalers a tenders a Especiayres."

The General Estates of Catalonia with headquarters at Perpignan[2] in 1350 regulated the status of apothecaries so that each town should have three arbitrators—a merchant druggist, a master physician and an apothecary, and these were entrusted to inquire at least once a week relative to the medicinal preparations as to whether these were correct and legal; any faults with them had to be reported to the officers of the law.

In 1433 an order was made that all prescriptions had to be clearly written in the native script; in 1445 the arbitrators had to examine the drugs in the shops every three months. In 1473 apothecaries were forbidden to possess more than one shop apiece. In 1640 the chief apothecary received the title of "Chief Council." The apothecaries had as their patroness St. Mary Magdalene. There was considerable rivalry between the trading apothecaries and the religious houses which maintained free dispensaries. The apothecaries complained especially of the Dominicans and they took the matter to Rome in 1635 and obtained favorable judgment, but the local courts did not uphold the ruling; the apothecaries appealed to Rome again in 1672, always winning their case; namely, that only trained apothecaries should be allowed to dispense medicines, but the legal victories did not seem to meet with desired success.

The museum of Barcelona contains quite a number of apothecaries' jars. There is also an old apothecary's workshop still in use where nothing is modern except the gas. This belongs to Don Pere Escuder *y* Duch and is known as "Santa Maria del Mar."

An account of the apothecaries of Barcelona is included among that of other guilds in the "Historia dels antichs Gremis dels Arts e Oficis de la Cuidat de Barcelona," by Gonzalez Sugranes.

[1] Second city of Spain to-day; during the middle ages was an important commercial and literary center; several times under French rule.

[2] Since 1642 has belonged to France.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1930–1931.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 10.

May 6, 1931.

To the Members of the Council:

99. Tentative General Program for the Seventy-Ninth Annual Meeting. With the approval of President Christensen, Local Secretary Grommet and the Committee on Standard Program of the Council, the Secretary submits the following tentative general program. Officials of the various affiliated organizations represented in the program have approved those features in which their respective organizations are directly interested.

GENERAL PROGRAM OF THE SEVENTY-NINTH ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AND OF AFFILIATED ORGANIZATIONS, HOTEL COLUMBUS, MIAMI, FLORIDA, JULY 27 TO AUGUST 1, 1931.

Alumni and other Group Luncheons may be arranged for Monday, Tuesday, Wednesday and Friday at noon and will be announced on the Bulletin Board at the Registration Desk.

MONDAY, JULY 27TH.

9:00 A.M. Second Meeting, Council AMERICAN PHARMACEUTICAL ASSOCIATION—Parlor "A."

9:30 A.M. National Association Boards of Pharmacy—Procter Hall.

9:30 A.M. American Association Colleges of Pharmacy:
Executive Committee—Parlor "C."
Teachers' Conferences:
Chemistry—Remington Hall.
Pharmacy—Whelpley Hall.
Materia Medica—Maisch Hall.
Pharmaceutical Economics—Parlor "B."

2:00 P.M. National Association Boards of Pharmacy—Procter Hall.

2:00 P.M. American Association of Colleges of Pharmacy—Remington Hall.

6:00 P.M. Dinner, National Association Boards of Pharmacy—Procter Hall.

6:00 P.M. Dinner, American Association of Colleges of Pharmacy—McAllister Hotel.

8:00 P.M. National Association Boards of Pharmacy—Procter Hall.

8:00 P.M. American Association of Colleges of Pharmacy—Remington Hall.

8:30 P.M. Reception and Dance, Courtesy Travelers' Auxiliary, Florida Pharmaceutical Association—Alcazar Hotel.

TUESDAY, JULY 28TH.

9:00 A.M. Joint Session, National Association Boards of Pharmacy and American Association of Colleges of Pharmacy—Procter Hall.

1:30 P.M. First Session, House of Delegates, AMERICAN PHARMACEUTICAL ASSOCIATION—Procter Hall.

2:30 P.M. National Association Boards of Pharmacy—Procter Hall.

2:30 P.M. American Association Colleges of Pharmacy—Remington Hall.

6:30 P.M. Banquet, AMERICAN PHARMACEUTICAL ASSOCIATION, followed by Dancing in the Spanish Gardens of the Club—Coral Gables Country Club.

WEDNESDAY, JULY 29TH.

9:00 A.M. First General Session, AMERICAN PHARMACEUTICAL ASSOCIATION—Procter Hall.

2:00 P.M. First Session, Scientific Section—Procter Hall.

2:00 P.M. First Session, Section on Education and Legislation—Remington Hall.

2:00 P.M. First Session, Section on Historical Pharmacy—Whelpley Hall.

2:00 P.M. First Session, Conference Pharmaceutical Association Secretaries—Maisch Hall.

6:00 P.M. Dinner, Kappa Psi Fraternity.

6:00 P.M. Dinner, Rho Chi Fraternity, followed by Annual Convention.
6:00 P.M. Dinner, Lambda Kappa Sigma Sorority.
7:30 P.M. Second Session, House of Delegates, A. PH. A.—Procter Hall.
8:00 P.M. Night in Dixie—Musical Entertainment followed by Street Dancing.

THURSDAY, JULY 30TH.

9:00 A.M. Third Meeting, Council A. PH. A.—Parlor "A."
9:00 A.M. First Session, Section on Commercial Interests—Procter Hall.
9:00 A.M. First Session, Section on Practical Pharmacy and Dispensing—Remington Hall.
9:00 A.M. First Session, Conference Pharmaceutical Law Enforcement Officials—Maisch Hall.
9:00 A.M. Second Session, Section on Historical Pharmacy—Whelpley Hall.
12:00 M. Luncheon, Veteran Druggists—McAllister Hotel.
2:00 P.M. Second General Session, A. PH. A.—Procter Hall.
6:00 P.M. Dinner, Phi Delta Chi Fraternity.
8:00 P.M. Joint Session, Scientific Section and Section on Practical Pharmacy and Dispensing—Procter Hall.
8:00 P.M. Second Session, Section on Education and Legislation—Remington Hall.
8:00 P.M. Second Session, Conference Pharmaceutical Association Secretaries—Maisch Hall.

FRIDAY, JULY 31ST.

9:00 A.M. Third Session, House of Delegates, A. PH. A.—Procter Hall.
2:00 P.M. Second Session, Scientific Section—Procter Hall.
2:00 P.M. Second Session, Section on Practical Pharmacy and Dispensing—Remington Hall.
2:00 P.M. Second Session, Section on Commercial Interests—Whelpley Hall.
2:00 P.M. Second Session, Conference Pharmaceutical Law Enforcement Officials—Maisch Hall.
6:00 P.M. Dinner, Special Groups.
7:00 P.M. Final Session, House of Delegates, A. PH. A.—Procter Hall.
8:30 P.M. Final General Session, A. PH. A., and Adjournment—Procter Hall.
10:00 P.M. First and Reorganization Meeting, Council A. PH. A.—Parlor "A."

SATURDAY, AUGUST 1ST.

7:15 A.M. Train leaves Florida East Coast Station for Key West, for those taking the Cuban Tour. Return to Miami on Wednesday afternoon, August 5th, in time to connect with trains leaving Miami.

The Ninth Annual Meeting of the Plant Science Seminar will be held, School of Pharmacy, University of Florida, Gainesville, Fla., July 20 to 24, 1931. A motor trip through southern Florida, will bring those attending the Seminary to Miami in time for the meeting of the Conference on Pharmaceutical Research.

The Tenth Annual Meeting of the National Conference on Pharmaceutical Research will be held at the Hotel Columbus on July 25, 1931.

The Fifth Annual Symposium of the Genus Mentha will be held in Miami during the meeting of the A. PH. A.

The following additional entertainment events have been provided for by the Local Committee of Arrangements:

MONDAY, JULY 27TH.

9:00 A.M. Reception and Address of Welcome, Ladies Auxiliary, Florida State Pharmaceutical Association—Alcazar Hotel, Ladies attending A. PH. A. meeting are invited.
2:00 to 5:00 P.M. Reception and Bridge Party, for Ladies—Alcazar Hotel.

TUESDAY, JULY 28TH.

9:00 A.M. Shopping Tour, for Ladies, leaving from Hotel Columbus.
2:00 to 5:00 P.M. Reception and Musical Program, for Ladies—Alcazar Hotel.

WEDNESDAY, JULY 29TH.

11:00 A.M. to 5:00 P.M. Bathing, Water Sports, Entertainment, Refreshments, Bridge and Dancing, for Ladies—Roman Pools, Miami Beach. Transportation from Hotel Columbus.

THURSDAY, JULY 30TH.

10:00 A.M. Motorcade, for Ladies, to Miami Beach, Coral Gables, the Citrus Section, an Indian Village and the Pan-American Airport.

7:00 P.M. Theater Party, for Ladies.

FRIDAY, JULY 31ST.

9:00 A.M. Golf Tournament—Miami Country Club.

1:00 P.M. Water Sports, Entertainment, Bathing, Bridge and Refreshments, for Ladies—Venetian Pools at Coral Gables, Transportation from Hotel Columbus.

A very interesting Sight-Seeing Boat Trip to the Marine Gardens and the Everglades, stopping at the Musa Indian Village, leaves the wharf near the Hotel Columbus each day of the meeting at 10:00 A.M. and returns at 2:00 P.M. Arrangements have been made for those who register, to make this trip on either day and members of the Entertainment Committee will accompany them. It is requested that those remaining all week and not taking the Cuban Tour, take this trip on Saturday, August 1st.

(*Motion No. 35*) *It is moved by Kelly that the tentative General Program of the Seventy-Ninth Annual Meeting be approved.*

100. State College of Washington Student Branch, A. Ph. A. Motion No. 31 (see Council Letter No. 9, page 402) has been carried and Secretary-Treasurer Wenz of the Branch has been notified.

101. Election of Members. Motions Nos. 32 and 33 (see Council Letter No. 9, page 403) have been carried and applicants numbered 266 to 326, inclusive, and H-22 to H-26, inclusive, are declared elected.

102. Investment of Funds. Motion No. 34 (see Council Letter No. 9, page 404) has been carried. Treasurer Holton reports the purchase of one $1000 City of Detroit, Michigan, Bond, 4%, due May 1, 1956, at par and accrued interest, for the Life Membership Fund. The total of investments held for this fund is now $39,600.

103. Meeting of the Committee on National Formulary. Chairman Gathercoal advises that the members have unanimously approved a meeting of the Committee, probably on June 29 and 30, 1931, at or near the same place at which the meeting of the Committee of Revision of the U. S. P. will be held, on June 26 and 27, 1931. A number of the members of the N. F. Committee will also attend the meeting of the U. S. P. Committee, the suggestion has been made that their expenses be evenly divided. Chairman Gathercoal recommends that the Council approve the holding of this meeting as the work of revision has progressed to the stage where a personal conference is highly desirable.

(*Motion No. 36*) *It is moved by Kelly that the proposed meeting of the Committee on N. F. be approved with the understanding that the cost will not exceed $1200 which was the amount approved for the meeting of the Committee in 1930.* With the approval of Chairman Hilton a vote is called for at this time but if there is objection or if comments are submitted, it will be considered as tentative.

104. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 327, J. R. Adams, Medical College, Charleston, S. C.; No. 328, Ben Agrant, 917 6th Ave., Brookings, S. Dak.; No. 329, Harriet Aldrich, S. D. S. C., Box 777, Brookings, S. Dak.; No. 330, Wilbur C. Anderson, Box 310, Harmarville, Pa.; No. 331, W. Birt Anderson, Jr., Dunnellon, Fla.; No. 332, Martin Bacik, 5602 Martin Ave., Detroit, Mich.; No. 333, Ben Bavly, 11320 Dexter St., Detroit, Mich.; No. 334, Margaret S. Beck, 943 Eighth Ave., Brackenridge, Pa.; No. 335, Joseph E. Blair, 106 Depot St., Latrobe, Pa.; No. 336, C. R. Caldwell, 1832 Line Ave., Shreveport, La.; No. 337, Thomas J. Casey, Jr., 704 Etna St., New Castle, Pa.; No. 338, Morris Chantz, 5413 Bossart St., Pittsburgh, Pa.; No. 339, Jack Anthony Chaverini, 1403 Locust St., McKeesport, Pa.; No. 340, L. V. Coleman, St. Cloud, Fla.; No. 341, Charles K. Creighton, 113 Line Way, Turtle Creek, Pa.; No. 342, Clarence A. Dangers, 924 8th Ave., Brookings, S. Dak.; No. 343, H. A. Deen, Vidalia, Ga.; No. 344, Stephen Edward Dobosh, 723 9th St., Monessen, Pa.; No. 345, Louis A. Dorn, 1331 Juinata St., N. S., Pitts-

burgh, Pa.; No. 346, Virgil Dotseth, 918 8th Ave., Brookings, S. Dak.; No. 347, Myles Edward Duellman, 115 North Thayer St., Ann Arbor, Mich.; No. 348, Clarence R. Duff, Box 576, New Smyrna, Fla.; No. 349, James B. Early, Receiving Hospital, Detroit, Mich.; No. 350, Warren W. Edinger, Jr., 1111 Palo Alto St., Pittsburgh, Pa.; No. 351, Welles Carl Eernisse, 703 12th Ave., Brookings, S. Dak.; No. 352, Harold Ellias, 5550 W. Warren St., Detroit, Mich.; No. 353, James Embley, 29th St. and N. W. 2nd Ave., Miami, Fla.; No. 354, Harvey Engstran, 924 8th Ave., Brookings, S. Dak.; No. 355, Eldon B. Erickson, 603 11th Ave., Brookings, S. Dak.; No. 356, James N. Etteldorf, 705 6th Ave., Brookings, S. Dak.; No. 357, M. H. Evans, Box 1039, Orlando, Fla.; No. 358, C. L. Fisher, 7031 Bennet St., Homewood Sta., Pa.; No. 359, Edward J. Fischer, College Station 611, Brookings, S. Dak.; No. 360, M. E. Glaten, 1339 E. 6th St., North, Portland, Ore.; No. 361, Dominic Fodora, 131 Oakwood Ave., Aliquippa, Pa.; No. 362, Harvey D. Frank, 43rd St. and Kingsessing Ave., Phila., Pa.; No. 363, James L. Frank, 1404 So. 57th Ave., Cicero, Ill.; No. 364, Byron B. Freeland, 51 E. Flagler St., Miami, Fla.; No. 365, Ferdinand H. Fritsche, 924 8th Ave., Brookings, S. Dak.; No. 366, Fred Girard, 405 E. Cedar Ave., Connellsville, Pa.; No. 367, William Howard Grady, 918 8th Ave., Brookings, S. Dak.; No. 368, Irving Herbert Grossman, 7700 McGraw St., Detroit, Mich.; No. 369 Robert Gruetzmacker, College Station, Brookings, S. Dak.; No. 370, J. M. Hayes, 12 Percy St., Charleston, S. C.; No. 371, Luis Higuera, Guillermo Prieto 82, Mexico, D. F.; No. 372, Frank M. Hill, 18268 Grand River Ave., Detroit, Mich.; No. 373, Albert G. Horst, 719 5th Ave., Brookings, S. Dak.; No. 374, Wallace A. Hull, 918 Industry St., Pittsburgh, Pa.; No. 375, Arthur R. Hurst, 717 6th St., Brookings, S. Dak.; No. 376, Alfred M. Hyde, 511 N. Cedar St., New Castle, Pa.; No. 377, Harry L. Jackson, 1100 Lincoln Road, Miami Beach, Fla.; No. 378, George E. Kalina, 2551 S. Spaulding St., Chicago, Ill.; No. 379, William Calvin Kessling, 425 30th St., McKeesport, Pa.; No. 380, Nelson Smith Kirk, Jamaica-Hillcrest, L. I., N. Y.; No. 381, Milton A. Landy, 49 Manilla St., Pittsburgh, Pa.; No. 382, Walter O. LeGrande, c/o Hankins Drug Store, Daytona, Fla.; No. 383, George Andrew Lehr, 703 12th Ave., Brookings, S. Dak.; No. 384, Cosmo Ligorio, 771 Union St., Brooklyn, N. Y.; No. 385, John Thomas Lindberg, 2002 Beaver Ave., McKeesport, Pa.; No. 386, Oscar George Lippert, 717 6th St., Brookings, S. Dak.; No. 387, Peter F. Lordi, 102–107 Alstyne Ave., Corona, L. I., N. Y.; No. 388, Irvin James Maloney, 703 12th Ave., Brookings, S. Dak.; No. 389, Stanford Sylvan Maresh, Men's Dormitory, Brookings, S. Dak.; No. 390, Paul E. Matteson, Creston, Ohio; No. 391, Clifton H. McCardell, Saybrook Apts., 113 G. Craft Ave., Pittsburgh, Pa.; No. 392, George F. Moreland, 1935 Dale St., Pittsburgh, Pa.; No. 393, Robert P. Moore, 1100 State Ave., Coraopolis, Pa.; No. 394, W. Lee Moose, Albemarle, N. C.; No. 395, Richard Mugge, 1021 N. W. 5th St., Miami, Fla.; No. 396 Harold F. Myhlertz, 712 Hillcrest Ave., Orlando, Fla.; No. 397, Alvin F. Nelson, 206 6th Ave., Brookings, S. Dak.; No. 398, Marshall J. Nicholson, P. O. Box 15, Willcox, Ariz.; No. 399, Francis O'Connell, 705 6th Ave., Brookings, S. Dak.; No. 400, Alvin E. Olson, Brookings, S. Dak.; No. 401, Russell M. Park, 702 8th St., Brookings, S. Dak.; No. 402, Leah May Payne, 901 6th St., Brookings, S. Dak.; No. 403, Edward A. Pelant II, 210 Medary Ave., Brookings, S. Dak.; No. 404, Luther H. Penberthy, 33 W. Church St., Orlando, Fla.; No. 405, Lon T. Pfeiffer, 411 7th Ave., Brookings, S. Dak.; No. 406, Frank J. Podsadlo, 10450 W. Chicago St., Detroit, Mich.; No. 407, Jospehine M. Puglisi, 411 Castner Ave., Donora, Pa.; No. 408, Harold G. Reynolds, 1302 6th St., Brookings, S. Dak.; No. 409, Herbert J. A. Richter, 705 6th Ave., Brookings, S. Dak.; No. 410, William C. Rock, 230 Berringer Place, Ben Avon, Pa.; No. 411, Frederick Lewis Russell, 421 Allen St., Grand Rapids, Mich.; No. 412, Wayne Clark Shanholtz, 810 Meclary St., Brookings, S. Dak.; No. 413, Leon E. Schule, 603 11th Ave., Brookings, S. Dak.; No. 414, Samuel Louis Schwitzer, 32 Niagara St., Pittsburgh, Pa.; No. 415, J. E. Strange, 84 Smith St., Charleston, S. C.; No. 416, James W. Swan, 1011 Aetna St., Connellsville, Pa.; No. 417, John J. Tananis, 532 Ammon St., Homestead, Pa.; No. 418, Lawrence Templeton, 715 S. Wood St., Chicago, Ill.; No. 419, Carl W. Thurston, 613 7th Ave., Brookings, S. Dak.; No. 420, Willis R. Troutman, 210 W. 7th Ave., Tarentum, Pa.; No. 421, Nicholas Carl Tucci, 356 Houston St., Washington, Pa.; No. 422, Donald F. Walter, 626 Chestnut St., Pitts-

burgh, Pa.; No. 423, J. Hobart Watters, 335 S. Pacific Ave., Pittsburgh, Pa.; No. 424, Irving Weinberg, 1437 S. Trumbull Ave., Chicago, Ill.; No. 425, J. L. Wieczorkowski, 2403 Mission St., Pittsburgh, Pa.; No. 426, Clarence B. Wiezcouk, 719 Seventh Ave., Brookings, S. Dak.; No. 427, Merle Francis Yelinek, Men's Dorm., Brookings, S. Dak.; No. 428, R. B. Yerge, 10800 W. Chicago Blvd., Detroit, Mich.

(*Motion No. 37*) *Vote on applications for membership in the American Pharmaceutical Association.*

105. N. F. Exhibit at the Meeting of the American Medical Association. The Committee on Scientific Exhibit of the A. M. A. has accepted the application of the Committee on National Formulary for space in the Scientific Exhibit for the Philadelphia Session of the Association, June 8–12, 1931. The following announcement will appear in the Convention Number of the *Journal of the A. M. A.* and in the Official Program of the Meeting:

AMERICAN PHARMACEUTICAL ASSOCIATION, Baltimore, National Formulary Revision Committee: Exhibit consisting of some of the National Formulary vehicles suitable for prescription practice; actual preparation of typical prescriptions; charts showing the results of questionnaires received from physicians, leading prescription stores and hospital pharmacies, showing the actual use of the National Formulary preparations.

The space allotted is adjoining that allotted to the U. S. P. Revision Committee and is without charge. Secretary Adley B. Nichols of the Committee on N. F. will arrange for and have charge of the exhibit and a number of Philadelphia pharmacists have kindly offered to coöperate. Secretary Nichols estimates that the expenses of the exhibit will not exceed $100.00.

(*Motion No. 38*) *It is moved by Kelly that the N. F. Exhibit be approved with the understanding that the expense will not exceed $100.00.*

E. F. KELLY, *Secretary.*

PICTORIAL HISTORY OF WISCONSIN PLANNED.

A state project for a pictorial history of Wisconsin, making use of both still and motion pictures to form a permanent record of scenes, customs, resources and government of the Commonwealth, is being undertaken by the University of Wisconsin extension division in coöperation with the Wisconsin State Historical Society. The photography is being done by the Extension Bureau of Visual Instruction. The plan embraces not only a pictorial history of the state as a whole but of each local community, from early days to the present.

THREE NEW SUGARS.

Isolation of three new kinds of sugar from the roots of dandelions, goldenrod, artichoke and other flowering plants has been accomplished after months of research work at the U. S. Bureau of Standards, it was stated orally April 24th, by Dr. R. F. Jackson of the polarimetry section, optics division of the Bureau. Each of the three sugars have different crystalline forms, but are all pure white. They are less soluble than cane sugar, dissolving twice as slowly in water. Their discovery adds to the family of some 50 to 75 sugars known to science, few of which have general use.

SOME OF IRELAND'S CONTRIBUTIONS TO PHARMACY AND RELATED SERVICES.

Robert Boyle, son of the Earl of Cork, became one of the founders of the Royal Society; he published "Medicinal Experiments or a Collection of Choice and Safe Remedies"—he compiled them, according to his statement, "because he was induced to do so by the dictates of Christianity and philanthropy. Sir Hans Sloane, of Ulster, studied at Apothecaries' Hall and formed friendships with Boyle and Sydenham; on Sir Isaac Newton's death he became president of the Royal Society.

"By all honorable means preserve the traditions, integrity and usefulness of your profession. To so preserve them you must safeguard the privileges gained through your scientific study, work and experience. To properly safeguard those privileges and prerogatives you must maintain an active militant organization. You owe this not only to yourselves but to the public health and safety as well."—Judge Chester A. Batchelor.

EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, H. C. CHRISTENSEN, C. E. CASPARI, J. H. BEAL, W. BRUCE PHILIP, T. J. BRADLEY. *Ex-Officio Members:* H. C. CHRISTENSEN, *President;* WALTER D. ADAMS, D. B. R. JOHNSON, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* C. B. JORDAN, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; E. N. GATHERCOAL, *Chairman,* N. F. Revision Committee; Chairmen of the Sections, A. PH. A.: E. E. SWANSON, B. V. CHRISTENSEN, RALPH E. TERRY, JOS. G. NOH, J. T. LLOYD; J. W. STURMER, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; W. M. HANKINS, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

U. S. CIVIL SERVICE EXAMINATION FOR ANTI-NARCOTIC AGENT.

The United States Civil Service Commission announces an open competitive examination for anti-Narcotic Agent. Applications for the position must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than June 9, 1931. The examination is to fill vacancies in the Bureau of Narcotics, Treasury Department, for duty in the field. The entrance salary is $2300 a year. Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city or from the United States Civil Service Commission, Washington, D. C.

HALL OF FAME CEREMONIES.

Busts, memorials to Monroe, Maury, Whitman and Whistler were unveiled at the annual ceremonies of the Hall of Fame, May 14th. It is hoped that like recognition will be given to Dr. Lyman Spalding at the next ceremonies in 1936. The efforts so well begun by the medical profession and supported by chemistry and pharmacy and other Public Health activities should be energized and bring the results which should long before now have been brought about. Keep this in mind—the next election will be held early in 1935. The establishment of the U. S. Pharmacopœia is a most important accomplishment, chiefly by the efforts and sacrifices of Dr. Lyman Spalding.

BIOLOGISTS DISAGREE.

The Federation of American Societies for Experimental Biology held its annual meeting in Montreal during the week of April 6th. The last session, held on April 11th, brought to surface keen rivalry among some of the members relative to the isolation of a new hormone. Three different experimenters, working independently and employing different methods in the last two years, have isolated an active substance from the adrenal cortex. Dr. J. N. Rogoff of Western Reserve University, Cleveland, named it "interrenalin." Dr. Hartman working with Dr. Katherine A. Brownell, of Buffalo, named it "cortin." At the same time Drs. W. W. Swingle and J. J. Pfiffner of Princeton announced they have succeeded in isolating the cortical hormone.

COST OF MEDICAL CARE.

Having accomplished at Philadelphia, Pa., the first complete survey of the medical facilities of any large city in the United States, the Committee on the Costs of Medical Care, of Washington, D. C., in a statement made public April 13th by the Department of the Interior, has found that citizens of that city average spending $50 each yearly on medical care. This per capita amount is divided among doctors, dentists, druggists and hospitals. About one-third of all the patients in the city, however, are treated either free or at reduced rates, it was found.

The net incomes of physicians ranged from a deficit of more than $1000 to a profit of $36,500 reported by one complete specialist. The average net income was $5156, general practitioners having an average of $3744, partial specialists $5265 and complete specialists $6797.

General practitioners in dentistry earned considerably more than general medical prac-

titioners, their net income being on an average $4983. The average net income for all dentists was put at $5102.

The Detroit survey showed that in that city both physicians and dentists earned more than in Philadelphia. The average net income for Detroit physicians was found to be $5596, or $440 more than in Philadelphia. The average Detroit dentist earned a net income of $6075.—Through *U. S. Daily*.

GEORGIA HONORS MEMORY OF CRAWFORD W. LONG, JOSEPH JACOBS AND OTHERS.

A plaque in honor of Dr. Crawford W. Long was unveiled, March 30th, at the Davis-Fischer Sanatorium, Atlanta, at a ceremony rededicating this institution as the Crawford W. Long Memorial Hospital. Miss Emma Long and Mrs. Eugenia Long Harper, daughters of Dr. Long, assisted. Inside the hospital lobby, tablets were unveiled in tribute to Joseph Jacobs, lifelong friend of Dr. Long, and to Dr. Edward C. Davis, one of the founders of the institution. Dr. Lamartine G. Hardman, retiring governor of Georgia, and Drs. Frank K. Boland, Edgar G. Ballenger, Allen H. Bunce and Thomas C. Davison were among the speakers. **Joseph Jacobs** was a member of the AMERICAN PHARMACEUTICAL ASSOCIATION and his untiring efforts brought deserved recognition of the discovery of ether anesthesia.

EXPERIMENTAL ADDICTION OF MONKEYS TO OPIATES.

Public Health Reports of March 27th publishes a research on "Experimental Addiction of Monkeys to Opiates" by Surgeon Lawrence Kolb and **Dr. A. G. DuMez.** The report shows that the minimum lethal dose of morphine and sulphate was about 85 mg. but one animal survived a dose of 125 mg. per kilo; young and small monkeys survived larger doses per kilo than older and larger animals. Seven milligrams of heroine per kilo of body weight killed the majority of monkeys that had not been previously given a toxic dose. Some animals that survived a toxic dose of morphine, heroine and codeine were less severely affected by slightly larger doses given a month afterward; by daily administration of these narcotics monkeys were made tolerant to increasingly large doses. Greater deterioration in general health was caused by administration of these narcotics and codeine was decidedly the most harmful and heroine the least. Tolerance was almost completely lost in about two weeks after withdrawal of the drugs and the monkeys improved in health and general appearance during the remainder of the period of abstinence. Abstinence over a longer period made them more sensitive and less resistant when injections were started again than they had been at the beginning.

The relative effects in the order of their severity of the three narcotics given to monkeys in one toxic dose or in smaller daily doses are as follows:

Toxicity: Heroine decidedly most toxic; morphine least.

General Health: Codeine decidedly most harmful; heroine least harmful.

Abstinence Producing Properties: Morphine most potent; potency of codeine very slight or non-existent.

OBSERVANCE OF INSULIN DISCOVERY.

The *Journal of the American Medical Association* reports that to observe the tenth anniversary of the discovery of insulin by Drs. Frederick G. Banting and Charles H. Best, Toronto, a course on insulin and its use, organized by the extension division of the University of Wisconsin, at the request of the State Medical Society, will be given during the week of May 18th for one day each in Madison, Milwaukee, Oshkosh, Wausau, Eau Claire and La Crosse Dr. Leland S. McKittrick, Boston, and Dr. Russell M. Wilder, of the University of Chicago, will, with Dr. Elmer L. Sevringhaus and a dietitian of the Medical School at Madison, give lectures and demonstrations.

PRESIDENT KARPINSKY LEAVES RUSSIAN ACADEMY OF SCIENCES.

The president of the Russian Academy of Sciences, Dr. A. P. Karpinsky, the distinguished geologist, is leaving his post at the Academy. This decision is the outcome of his unsuccessful protests against the recent forced decision of the Academy to deprive of its membership four academicians, including such historians as S. F. Platonov and E. V. Tarle, whose scientific views have been pronounced by the authorities to be incompatible with their presence in the academy of a communistic state. It is noteworthy that at the same meeting of the Academy several foreign scientific workers were elected as foreign members. It appears clear, in the circumstances, that the acceptance of membership of the Academy of U. S. S. R. must involve silent agreement with

the basic principle underlying the attitude of the Soviet authorities toward science.—*Nature* (March 7, 1931), page 346.

PERSONAL AND NEWS ITEMS.

The John Scott Prize, of the City of Philadelphia, consisting of a bronze medal and $1000 has been awarded to Orville S. Peters, Chevy Chase, Maryland, for his invention of the electric telemeter. Dr. Peters was from 1910 to 1918 assistant physicist at the Bureau of Standards. The prize was founded by a British pharmacist (chemist).

Among the speakers at the formal dedication on April 20th of the School of Medicine and Hospital of Duke University were Dr. David Linn Edsall, dean of Harvard Medical School; Dr. Lewis Hill Weed, director of the Johns Hopkins School of Medicine; Dr. William Henry Welch, of the Johns Hopkins; Dr. Watson S. Rankin, of Charlotte, director of the division of hospitals of the Duke endowment; Governor O. Max Gardner, of North Carolina, and Dr. Thurman D. Kitchen, of Wake Forest College.

President M. E. Rasdel, of Nebraska Pharmaceutical Association, has given a prize to a student of the pharmacy schools of the University of Nebraska and another of Creighton University. The prizes are to be given for outstanding work in dispensing. The students have been named but cannot be given at this time. It is a fine spirit of helpfulness and coöperation of which acknowledgment has been made by Secretary Kelly.

Editor G. A. Bender, of the *Northwestern Druggist,* recently spoke to the pharmacy students on the current pharmaceutical literature.

Upon invitation of **President H. C. Kruckeberg** representatives of various pharmaceutical societies in the Twin Cities attended the April luncheon of Minneapolis Veteran Druggists' Association.

Dr. William H. Welch, professor of the history of medicine and director of the Institute of the History of Medicine, Johns Hopkins—has gone to London, where he is to receive the medal of the Royal Sanitary Institute.

President Samuel Palmer Brooks, of Baylor University, is seriously ill, no hope being given for his recovery. He received his doctors' degree at Yale and has been president of Baylor for nearly thirty years.

At the time of closing this form (May 14th) we are advised of the death of Dr. Brooks. The writer served under him for a number of years, and prizes the association.

Col. William L. Keller, M.D., chief of surgical service of Walter Reed General Hospital, will be the recipient of D.Sc. degree at the commencement exercises of the Medical College of Virginia, June 2nd.

Prof. Marvin R. Thompson delivered an address before the April meeting of the Biological Society of the University of Maryland on "A Pharmacodynamic Study of Ergot." Our fellow member, **Dr. John C. Krantz, Jr.,** is the Secretary of the Society.

J. Cameron, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, of the Pharmaceutical Department, Peiping Union Medical College, Peiping, has been visiting in Europe giving attention to the larger pharmacies and those of the hospitals. He will spend several weeks in Canada and the United States before returning to China.

Dean A. Richard Bliss, of the Pharmacy Department of the University of Tennessee, was in Baltimore recently, responding to the invitation of Dean DuMez, to address the student body of the School of Pharmacy, University of Maryland—the subject of his address was "Some Essential Character Traits of Pharmacists."

Linne E. Jones, Oregon City, Ore., has been appointed Secretary of the Oregon Board of Pharmacy and will assume office on May 21st.

Dr. H. H. Rusby celebrated his 76th birthday on April 26th. While congratulatory messages were received the day was quietly spent with members of the family.

Dr. J. Rosin, vice-president and chemical director of Merck & Co., has been elected a member of the Committee of Revision of the United States Pharmacopœia XI to fill the vacancy caused by the death of Edward V. Howell. Dr. Rosin took an active part in the revision of the pharmacopœia as a member of the committee on the ninth and tenth revisions. He is a graduate of the chemistry department of the University of Pennsylvania.

Dr. Herbert Raubenheimer has been elected professor of Commercial Pharmacy on the faculty of St. John's College School of Pharmacy. He is the son of **Prof. Otto Raubenheimer,** well and favorably known pharmacist.

Honoring **Dr. James H. Beal,** forty members of the Orange County Florida Druggists' Association gave a dinner at which time the meeting of the A. PH. A. in Miami was discussed.

Denny Brann, of Des Moines, Iowa, delegate to the House of Delegates of the Section on Commercial Interests, A. PH. A., opened a professional pharmacy on May 1st at 720 Locust St., Des Moines. There will be day and night service and the establishment will be an exclusive pharmacy.

Elmer H. Bobst, treasurer of Hoffmann-LaRoche was honored at a luncheon by co-workers and friends on the completion of twenty years of association with this corporation, on April 16th.

Dean Charles B. Jordan, of Purdue School of Pharmacy, has been given a prominent place in the Who's Who of the Michigan University Alumni group. Dean Jordan graduated from Michigan in pharmacy in 1910, and received his Master of Science from the same institution in 1912.

A picture and short account of his life appeared in a recent issue of the *Michigan Alumnus*. It stated that, "his principal effort aside from the duties of his position has been to help raise the standard of pharmaceutical training."

Francis B. Hays, dean of the editorial staff of the *Druggists Circular* recently was host at a luncheon party at the Press Club. The guests included **Dean Henry V. Arny** of Columbia University College of Pharmacy; **Secretary Robert P. Fischelis,** New Jersey Board of Pharmacy; **J. Leon Lascoff,** member New York State Board of Pharmacy; **Clyde L. Eddy,** E. R. Squibb & Sons; **Harold Hutchins,** of the *Druggists Circular*, and **Reginald Dyer,** editor *The Practical Druggist.*

THE BEGINNING OF THE SIXTH CENTURY OF AN ITALIAN COLLEGE OF PHARMACY.

Announcement has been received from President Teofilo Mariani, of the College of Chemistry and Pharmacy, Rome, of the celebration of the fifth centennial in connection with the meeting of the Italian Pharmaceutical Society to be held in Rome May 21st–24th.

The announcement states that the Nobile College dates its present name and charter from the beginning of the fifteenth century; in other words, the eighth of March, 1429, when Pope Martin V established it by a special bull.

It calls attention, furthermore, to the fact that this venerable institution is really of even greater age than five hundred years because it was originally founded under the name of *Universitas Aromatariorum.* (Druggists' University.)

The institution is concerned with the teaching of pharmacy and related specialties and originally had to do with the regulation of pharmaceutical standards, tariffs and other subjects, working in close coöperation with the departments of hygiene and public health.

Casa E Chiesa Del "Nobile Collegio de Speziall" al Foro Romano. (Building and Church of Pharmacy College, Roman Forum.)

An open invitation is extended by the president, Teofilo Mariani, to all those interested to attend the celebration of the fifth centennial.

Secretary E. F. Kelly, of the AMERICAN PHARMACEUTICAL ASSOCIATION, has written a congratulatory letter to President Teofilo Mariani and extended best wishes for continued and growing success of the College and of the Italian Pharmaceutical Society.

FIGHTING DISEASE WITH DRUGS.

"Fighting Disease with Drugs," which has been prepared under the editorship of Dr. John C. Krantz, Jr., will be ready for distribution before the end of this month. It is of great interest to all members and pharmacists generally that this book, which contains articles by a number of outstanding pharmacists, has been designated the second foremost book for the month of May by the Scientific Book of the Month Club. This book will make the public better acquainted with the work that pharmacy is doing and the part that it has had in science and commerce and in public health activities. It is hoped to write at length regarding this publication in the next issue of the JOURNAL.

Williams & Wilkins, Baltimore, are the publishers of the book.

The New York Pharmacist for April contains an article by E. F. Kelly, secretary of the A. PH. A., on the objects of the ASSOCIATION; it evidences the helpfulness of the *Pharmacist* in promoting the work of Pharmacy. Another article of interest to retailers is that by Samuel S. Dworkin on "The Combination Deal Racket." The author desires an expression from retailers on the subject discussed in the message.

The Maryland Pharmacist for April contains an editorial on "Self Preservation Is Now the Fight;" in it Editor Swain ably discusses the present status of pharmacy in the drug business. He makes a telling statement in that "If pharmacy is to become the profession that it deserves to be, it must be through the effort of those who believe in its essential and intrinsic worth."

The Mask, of Kappa Psi Pharmaceutical Fraternity for April, has been named the "Philip-Stoll Number." The sketch of W. Bruce Philip requires seven pages to give very briefly an account of the many things that have been inaugurated and carried forward under his direction. The article interestingly tells of the earlier years and brings some of his activities up to the present. Ferdinand Stoll's energy is depicted in the sketch—besides his work as member of the faculty of Louisville College of Pharmacy, Professor Stoll instructs the nurses of several of the Louisville hospitals and is head pharmacist for the T. P. Taylor pharmacies of Louisville. He is working at the University for his M.S. degree.

The April number of *The Mask* honored the editor of JOURNAL A. PH. A. by the publication of an address given before the student body of the U. of Maryland School of Pharmacy.

The Northwestern Druggist gives an illustrated account of the Veterans' Hospital Pharmacy, near the Twin Cities. The chief pharmacist is Waldemar Sherk, a graduate of the University of Minnesota School of Pharmacy. He has been in charge for 4 years and has in that time filled more than 100,000 prescriptions. He states that the prescribing physicians are confined very closely to preparations and drugs of the U. S. Pharmacopœia and the National Formulary, by official regulations.

Commerce Reports, U. S. Department of Commerce, issues valuable reports because of the information contained, and these are frequently quoted in the JOURNAL. Our fellow member, F. A. Delgado, looks after the Chemical Division and these reports are of particular interest to pharmacists, in all of the divisions of pharmacy. A very interesting and informative issue reporting on "Essential Oils in the United States Industries" is before us in making this brief notation.

We are indebted to Editor C. H. Farquharson, of the *Pharmaceutical Journal* of New Zealand, for the New Zealand *Free Lance*, giving an illustrated account of the recent earthquake in New Zealand which destroyed much property and many lives were lost; every pharmacy in Napier was destroyed. Reference to the great disaster was made in the April JOURNAL. Along with other losses pharmacists have endured great hardships, but have met the situation with fortitude and determination to reëstablish themselves. We thank the Editor for the copy of *Free Lance* and express the hope that progressive recovery from the effects of the catastrophe is being made.

The Pacific Drug Review is giving wholehearted support to the survey under the direction and as mapped out by **W. Bruce Philip.** The May issue of the Review states:

"*The Pacific Drug Review* endorsed the Bruce Philip survey in principle in its April issue; it reaffirms its position and its belief that if fairly and honestly conducted, without prejudice, and with a sincere desire to get at the truth and to use that truth to convince manufacturers that the retail pharmacist is entitled to some measure of protection, the survey will be a fine thing for all concerned.

"But, we submit that pharmacy will have to be more united in thought and action than it has ever been if full benefits are to be obtained."

Mr. Philip has long been in the service for pharmacy and pharmacists and for every associated drug activity that seeks to better conditions.

The British pharmaceutical publications have made favorable mention of the article of the March JOURNAL on "Pharmaceutical History Brought to Light by a Famous Misnamed Picture," by Elsie Woodward Kassner.

According to an illustrated article in the *American Druggist* a memorial tablet has been placed in the "Swallows Corner Pharmacy" (the successor of the pharmacy of Matteo Palmieri) which is inscribed:

"To Matteo Palmieri, citizen of Florence of the 15th Century, historian, moralist, poet—elected to the highest office of the Republic Orator at Naples, Rome, Bologna and Siena, who matriculated in the arts of pharmacy and exercised it in this pharmacy, thus giving ex-

ample of the wise, industrious and simple life of old Florentine citizens in public and private affairs."

The same publication also sketches the Timmermann Pharmacy of New York City (Richard Timmermann and Robert Gerstner, proprietors). This pharmacy averages about 150 prescriptions daily, and 450 physicians depend upon this pharmacy for bacteriological information—the gross income of the establishment has been stated to be about $135,000 monthly.

The *Canadian Pharmaceutical Journal* of April 15th quotes Prof. C. F. Heebner in the following:

"The ideal pharmacist is the one who has retained his professional standing and used it to aid him in achieving commercial success. There is no incompatibility between professionalism and commercialism in pharmacy if they are developed side by side; each in its own proportion and not at the expense of the other. It is quite obvious that one cannot become a successful pharmacist unless he is a good business man, but neither can he become a successful pharmacist unless he is a pharmacist."

OBITUARY.

JAMES FRANKLIN BALLARD.

James F. Ballard, president of James F. Ballard, Inc., St. Louis, died April 23rd in the Madison Hospital, New York City, following an illness contracted in the tropics about two years ago. He was internationally known as a collector of rare rugs and as an authority on the art of weaving.

Mr. Ballard was born at Ashtabula, Ohio, July 16, 1851. As a young man he engaged with a wholesale drug firm in Nashville; later, he travelled as representative of another wholesale house, which brought him to St. Louis, where he engaged in business on his own account in 1882. His success in business enabled him to pursue a hobby—that of collecting rare rugs. His first purchase cost him $350.00; later, he spent many times that amount in travel expenses to secure rare weaves; in order to buy intelligently Mr. Ballard systematically studied the art of rug-making. He travelled a half million miles in search of rarities; among these purchases were a rug produced by an art which had been lost, and the finest Imperial Chinese rug ever woven for the Emperor's palace. In 1922 he presented a collection of rare rugs, valued at $500,000 and containing 126 specimens including Persian, Spanish, Damascene, Chinese, Asia Minor and other varieties to the Metropolitan Museum of New York and he was equally generous to the St. Louis Museum. Mr. G. A. Pfeiffer, in 1927, presented a marble bust of Mr. Ballard to the Metropolitan Museum.

The deceased was interested in a number of industrial, business and banking institutions, active member of the Missouri Historical Society, Archaeological Society, National Academy of Design, Indian Society of Oriental Art (Calcutta), New York Water Color Society, and member of many clubs in St. Louis, New York and Washington.

Mr. Ballard is survived by two daughters, Miss Bernice C. Ballard and Mrs. David B. White (née Nellie Ballard). Funeral services were held at Mrs. White's home in St. Louis, and interment in Bellefontaine cemetery.

CHARLES G. LINDVALL.

Charles G. Lindvall, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1897 died January 12th at Los Angeles, Calif., aged 72 years. Mr. Lindvall was engaged in the drug business at Moline, Ill., for many years, retiring about thirteen years ago; later, he moved with his family to California. In former years he was a frequent attendant at the annual meetings of the AMERICAN PHARMACEUTICAL ASSOCIATION and active in Illinois Pharmaceutical Association.

Mr. Lindvall is survived by his widow, a son, Frederick, and a daughter, Bessie, all of Los Angeles, and a brother, Alfred, a resident of Moline.

Sympathy is expressed to Mrs. R. L. Deer, of Oreland, Pa., and to **Dr. and Mrs. Robert P. Fischelis,** because of the death of Mr. Deer, father of Mrs. Fischelis, on May 5th, aged 64 years. The deceased was manager of the Chicago Branch of H. K. Mulford & Co. for more than 25 years, when he was called, in 1919, to take charge of the general branch house business. The burial services were held at Washington Court House, Ohio; the widow and Dr. and Mrs. Fischelis accompanied the body.

SOCIETIES AND COLLEGES.

CALL OF SCIENTIFIC SECTION, A. PH. A.

Members and Friends of the Scientific Section,
AMERICAN PHARMACEUTICAL ASSOCIATION:

The response to the first appeal for papers for the Scientific Section for the Miami meeting has been very encouraging. There are many others, however, who are planning to contribute papers, we feel certain. Any papers which will be helpful in U. S. P. Revision work are especially solicited at this time.

The closing date for acceptance of titles and abstracts has been moved forward to June 1st. Short abstracts must accompany the titles so that a complete set of abstracts can be made available for those attending the convention. A copy of each paper should be in the Secretary's hands prior to the convention.

This is the final notice for the Miami Convention, Scientific Section, A. PH. A., July 27th to August 1st, at the Columbus Hotel.

L. W. ROWE, *Secretary.*

E. E. SWANSON, *Chairman*, Scientific Section. c/o Parke, Davis & Co., Detroit, Mich.

The foregoing call will answer in a general way for all the sections, hence the names of the officers are reprinted here, so that prospective contributors of papers may address them properly. Usually, but not necessarily, the papers are mailed to the Secretary—it is advisable to send a carbon copy to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION; this, however, is a matter entirely with the author and only for assurance of having the paper for presentation at the meeting.

Committees, also, should prepare their reports for submission.

The names of the Section Officers follow:

Scientific Section.—*Chairman*, E. E. Swanson, % Eli Lilly & Co., Indianapolis, Ind.; *First Vice-Chairman*, L. E. Warren, Bureau of Chemistry, Washington, D. C.; *Second Vice-Chairman*, R. E. Schoetzow, 149 Joralemon St., Brooklyn, N. Y.; *Secretary*, L. W. Rowe, % Parke, Davis & Co., Detroit, Mich.; *Delegate to the House of Delegates*, H. A. Langenhan, Seattle, Wash.

Section on Education and Legislation.—*Chairman*, B. V. Christensen, Gainesville, Fla.; *Vice-Chairman*, Rudolph H. Raabe, Ada, Ohio; *Secretary*, C. M. Anderson, Oklahoma City, Okla.; *Delegate to House of Delegates*, Glenn L. Jenkins, Baltimore, Md.

Section on Practical Pharmacy and Dispensing.—*Chairman*, Ralph E. Terry, 715 So. Wood St., Chicago, Ill.; *Vice-Chairman*, A. Zieffle, Corvallis, Ore.; *Secretary*, W. Paul Briggs, 2121 H St., N. W., Washington, D. C.; *Delegate to the House of Delegates*, H. C. Newton, Omaha, Neb.

Section on Commercial Interests.—*Chairman*, Jos. G. Noh, Omaha, Neb.; *First Vice-Chairman*, Rowland Jones, Gettysburg, So. Dak.; *Secretary*, Leon Monell, Buffalo, N. Y.; *Delegate to the House of Delegates*, Denny Brann, Des Moines, Ia.

Section on Historical Pharmacy.—*Chairman*, J. T. Lloyd, 300 Court St., Cincinnati, Ohio; *Secretary*, L. E. Warren, Bureau of Chemistry, Washington, D. C.; *Delegate to the House of Delegates*, George D. Beal, Pittsburgh, Pa.; *Historian*, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

The Historical Section, A. PH. A. has been favored by Missouri Botanical Garden with a copy of the "Proceedings of the Cinchona Tercentenary," for which thanks are extended. The JOURNAL has, in several of its issues, referred to the celebration and quoted at length from the addresses made on that occasion.

AMERICAN MEDICAL ASSOCIATION.

The annual meeting of the American Medical Association will be held in Philadelphia, June 8th to 12th—a large attendance is expected. The *Journal A. M. A.* of May 9th is an illustrated number and lists the exhibits. Among the illustrations are those relating to medicine, public institutions, etc., and also a picture of the Philadelphia College of Pharmacy and Science. Pharmacists will be interested in many of the exhibits—those of the American Medical Association, of the hospitals, Hygienic Laboratories, etc. Of great interest are the following announcements in the *Journal:*

AMERICAN PHARMACEUTICAL ASSOCIATION, Baltimore: National Formulary Revision Committee: Exhibit consisting of some N. F. vehicles suitable for prescription practice; actual preparation of a typical prescription; charts showing the results of questionnaires received from physicians, leading prescription stores and hospital pharmacies, showing the actual use of the National Formulary preparations.

UNITED STATES PHARMACOPŒIAL CONVENTION, Washington, D. C.: Pharmacopœia of the United States. Exhibit consisting of historical material connected with past revisions of the United States Pharmacopœia with a display of Pharmacopœial drugs and preparations embodying the official products.

Many other exhibits should be listed, but references would become too extended for available space; for apparent reasons only the two following will be mentioned. Eli Lilly & Company's exhibit will be simply illustrated with photographs, moving pictures, microphotographs, etc. Merck & Co., Inc., will include in their display a model ethical pharmacy with full equipment for the practical demonstration of new methods in prescription filling. Of historic interest, there will be displayed the bronze mortar and pestle used in the original Merck Pharmacy in the seventeenth century. It is interesting to note that the aisles in the exhibit hall have been named in memory of deceased who have honored the profession of medicine, thus Gorgas avenue, Osler avenue, etc.

INTERNATIONAL PHARMACEUTICAL FEDERATION.

The International Pharmaceutical Federation has issued an official circular letter announcing the election of T. Potjewijd, Chief Pharmacist of the hospital of the University of Leyden, as secretary of the Federation. Resolutions relating to the life and work of Dr. Albert Schammelhout, and extending sympathy because of the loss by his death, are made of record. (The JOURNAL reported his death in the March issue, page 298.)

The officers of the Federation are: *President*, J. J. Hofman, 4 Schenweg, The Hague; *Vice-Presidents:* M. G. Barthet, 1 rue Phalsbourg, Paris; E. Host Madsen, Vesterbro Apotek, Copenhagen V; E. Saville Peck, 30 Trumpington St., Cambridge; H. Thoms, 6 Hohenzollernstrasse, Berlin-Steglitz; Otto von Koritsansky, 17 Hegedus Sander ucca, Budapest VIII.

SOCIETY FOR THE HISTORY OF PHARMACY.

The annual meeting of the Society for the History of Pharmacy will be held in Vienna, Austria, May 14th–17th. An interesting program has been prepared, including papers and display of historical material.

OFFICERS OF AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

The American Drug Manufacturers' Association, at its recent meeting, elected the following officers:

President, Nicholas H. Noyes, Indianapolis; *First Vice-President*, A. Homer Smith, Philadelphia; *Second Vice-President*, A. C. Boylston, St. Louis; *Third Vice-President*, Dr. John F. Anderson, New Brunswick; *Secretary and Executive Vice-President*, Carson P. Frailey, Albee Building, Washington, D. C.; *Treasurer*, Franklin Black, New York City. *Executive Committee:* S. B. Penick, New York City; O. W. Smith, Detroit; J. H. Foy, Newark; R. Lincoln McNeil, Philadelphia.

STATE ASSOCIATION OFFICERS, 1930–1931.

The JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 10 W. Chase St., Baltimore, will be pleased to receive brief accounts of proceedings of Association meetings, and names of officers-elect for the roster. The JOURNAL seeks to be of service by having the roster in each issue for the convenience of State and National officers and members.

Georgia.—*President*, R. C. Coleman, Dublin; *First Vice-President*, J. B. Pendergrast, Altanta; *Second Vice-President*, B. H. Peterson, Mt. Vernon; *Third Vice-President*, H. L. Chichester, Macon; *Secretary-Treasurer*, Robert C. Wilson, Athens.

Kansas.—*President*, Terry L. Foltz, Hutchinson; *First Vice-President*, Joe Demain, Macksville; *Second Vice-President*, C. W. Evans-Lombe, Coffeyville; *Treasurer*, Walter H. Varnum, Lawrence; *Librarian*, L. D. Havenhill, Lawrence; *Secretary-Manager*, Roy C. Reese, Topeka.

GOLDEN ANNIVERSARY MEETINGS.

Among the 50-year old associations this year are Massachusetts, Nebraska and Virginia. These associations are making special efforts for this convention. Massachusetts meets at Swampscott, Nebraska at Lincoln and Virginia at Virginia Beach. Congratulations and good wishes to all.

Dr. A. A. Michelson, discoverer of the speed of light, died at Pasadena, Calif., May 9th, aged 78 years. His name has been one of the foremost in physics for nearly a half century; he was the first American Nobel prize winner.

ARKANSAS DISTRICT MEETINGS.

District meetings of the Arkansas Pharmaceutical Association, preliminary to the state convention at Fort Smith, June 9th–11th, were held as follows: April 6th, Marianna; April 7th, Blytheville; April 8th, Paragould; April 9th, Newport; April 10th, Batesville; April 13th, Nashville; April 14th, El Dorado; April 15th McGehee; April 16th, Pine Bluffs; April 17th, Little Rock; April 20th, Hot Springs; April 21st, Fort Smith; April 22nd, Fayetteville; April 23rd, Harrison; April 23rd, Russelville. W. Irl Brite of Fort Smith, president of the association; **E. D. Oslin** of Little Rock, secretary-manager, and **C. R. Counts** of Mulberry attended each of the district meetings. Pharmaceutical research, national legislation, prerequisites for pharmacists and general business conditions were among the topics of discussion.

CALIFORNIA PHARMACEUTICAL ASSOCIATION.

Hotel San Carlos has been selected for the headquarters hotel for the meeting of the California Pharmaceutical Association at Monterey. The sessions will open May 25th. The meeting promises to be most interesting; the survey carried on under direction of Secretary W. Bruce Philip will be reported on, and it is hoped will result in benefits to the retailers and, incidently, to the other branches of drug-trade activities.

NEW SERVICE OFFERED RETAIL DRUGGISTS OF INDIANA.

A new service for retail druggists of Indiana was announced during the two-day Retail Druggists' Business Conference held recently at Purdue University as part of the work of the Pharmacy Extension Department.

All druggists attending the Conference were asked to examine four educational window displays and were told that the Extension Department of the School expected to arrange displays of this nature frequently and ship them to the druggists of the state for use in their windows. These displays were all educational and professional, none of them having any commercial aspects. Retailers of the state were very enthusiastic about this type of display, and the School has received many requests for the service.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.

Among the speakers of the Oklahoma Pharmaceutical Association meeting were Secretary Roy C. Reese, of Kansas Pharmaceutical Association, President Julius H. Riemenschneider, of the N. A. R. D.; Lloyd Harris of Oklahoma University. Dean D. B. R. Johnson reported for the A. Ph. A. The officers elected for the ensuing year are: *President*, C. V. Nichols, Anadarko; *First Vice-President*, C. E. Stanley, Clinton; *Second Vice-President*, J. Braden Black, Oklahoma City; *Third Vice-President*, Ira B. Taylor, Cordell; *Treasurer*, H. S. Caldwell, Oklahoma City; *Secretary*, David McLemore, Britton.

VIRGINIA SECTIONAL MEETING.

The Virginia Pharmaceutical Association held an interesting and profitable sectional meeting in Winchester, May 14th.

WEST VIRGINIA PHARMACEUTICAL ASSOCIATION.

West Virginia Pharmaceutical Association will celebrate its silver anniversary at the Wheeling meeting June 17th and 18th. It is hoped to have all living charter members present. Secretary Haymaker announces that twenty-five members who are active to-day were present at the first annual meeting.

NEBRASKA PHARMACEUTICAL ASSOCIATION.

Nebraska Pharmaceutical Association will hold its Golden Jubilee Convention, June 8th–11th, at Lincoln.

Among the speakers of the meeting will be Lucien Stark, President of Nebraska State Medical Association, and Julius Riemenschneider, President of the N. A. R. D.

The Southern Pharmaceutical Journal nominates Herbert Parker of Jonesboro, Arkansas, for the "Southwestern Hall of Fame," "because he is a former president of the Arkansas Pharmaceutical Association and one of its leaders, because he is the secretary of the Arkansas Board of Pharmacy, and has been among its membership for many years, because the prescription business interests him more than anything else in his stores, because he has one of the finest drug stores in Arkansas, because he is the warm friend and colleague of all the doctors in his area and is a member of the Arkansas State Medical Association,

because he is the soul of charming hospitality and belongs in that rare category of people who make real friends."

OFFICERS-ELECT, MINNESOTA PHARMACEUTICAL ASSOCIATION.

The officers-elect of the Minnesota Pharmaceutical Association, to be installed at the 1932 convention, in Minneapolis, next February, are as follows: *President*, Harry Iverson, St. Paul; *Vice-Presidents*, George H. Countryman, Fergus Falls; C. A. Anderson, Minneapolis and Anna M. Danielson, Minneapolis; *Secretary*, Gustav Bachman, Minneapolis; *Treasurer*, H. Martin Johnson, St. Paul; *Executive Committee Member*, Joseph Vadheim, Tyler. The following names will be presented to Governor Olson as suggestions for the appointment of a member of the Board of Pharmacy: John Nelson, Lake Park; Richard J. Messing, St. Paul; Joseph Vadheim, Tyler; H. O. Tiegen, Moorhead, and Paul Stucky, Waseca.

PHARMACISTS AND PHYSICIANS MEET.

On April 9th the Cambria Co. (Pa.) Medical Society and the Cambria Somerset (Pa.) Retail Druggists' Association, held a joint meeting. A dinner preceded the convention at which about one hundred and twenty-five members of the two organizations were present. Dr. D. P. Ray, President of the Cambria Co. Medical Society presided.

Prof. C. Leonard O'Connell of the University of Pittsburgh School of Pharmacy spoke on "The Pharmacist as an Aid to the Physician." He stressed the progress in education in the pharmacy schools, the purpose being to increase the standards of the profession and to make the pharmacist of greater service in the community.

Dr. A. C. Morgan, professor of Clinical Medicine at Temple University, spoke on "Applied Therapeutics." In his opinion the medical professions are growing away from the human side and laying too much stress on the purely economical side.

SILVER ANNIVERSARY OF THE AMERICAN DRUGGISTS FIRE INSURANCE COMPANY.

The American Druggists Fire Insurance Co. will celebrate its 25th anniversary during the last week of May at its home office in Cincinnati. The event will be of exceptional interest enhanced by the presence of officials of various pharmaceutical and drug-trade associations. All the officers and directors of the Company and representatives will be present for the meeting. The Ohio Valley Druggists' Association and the Cincinnati Branch of the A. PH. A. will assist in looking after the entertainment of the visitors. A day will be spent on a sight-seeing and scenic trip on the Ohio River and include a visit to the tomb of William Henry Harrison, to the birth-place of General Grant. The festivities will conclude with a dinner on May 28th.

VACATION WINDOW DISPLAYS.

The N. W. D. A. has prepared special lithographed window display material for druggists to be used during the vacation season. One of the displays shows scenes of bathing, camping, tennis, golf, etc., another is illustrative of bathing and swimming needs and toilet requisites, and another of antiseptic and healing preparations that may become necessary. Wholesale druggists are ready to supply these beautiful window trims to the retailers who will agree to make use of them.

MEMBERS ARIZONA BOARD OF PHARMACY.

The members of the Arizona Board of Pharmacy are: *President*, Fred W. Ritter, Phoenix; *Vice-President*, Sam Ensminger, Prescott; *Secretary*, H. A. Twining, Phoenix; *Chief of Examiners*, Arthur Lee Phelps, Phoenix; Marshall J. Nicholson, Willcox; E. M. F. Ivey, Warren; Paul D. Stormont, Globe.

Arizona will have a new anti-narcotic law on June 13th, which includes regulation of the sale of peyote.

DISTRIBUTION OF MEDICINALS IN CANADA.

It is stated that two well-known drug firms now operate in Canada with dealer organizations covering rural districts. One of these firms is reported to have 600 travelers disposing of products direct to the consumer. Canadian representatives for drug lines state that in practically all cases where sizable sales volumes are attained, the goods sold are frequently packaged, or even partly manufactured and packaged in Canada. (Trade Commissioner, Harvey A. Sweetser, Toronto.)

RHO CHI, HONORARY PHARMACEUTICAL SOCIETY, INSTALLS FOUR NEW CHAPTERS.

ZADA M. COOPER, SECRETARY.

Rho Chi, National Honorary Pharmaceutical Society, has made satisfactory progress during the school year of 1930–1931. Four new chapters have been installed recently.

Pi Chapter, at North Pacific College of Oregon, Portland, was installed on the evening of April 25th. Dr. F. A. Gilfillan of the staff of the Oregon State College and member of Beta Chapter was the installing officer. Eleven were initiated, three staff members, one graduate student and seven undergraduates: Dean Antone O. Mickelsen, M. A. Starkman, Ruth MacFarlane, Phillip J. Smithhisler, Clyde Boyle, Everett C. Crist, Royal A. Crowell, Edward C. Darnell, Marion E. Flaten, Benjamin J. Harbinsky and Albert E. Nordblom.

Rho Chapter was installed at the University of Washington, Seattle, May 1st. Dean Charles W. Johnson, who is an honorary member of Epsilon Chapter, acted as installing officer and eleven members were initiated, four undergraduates and seven graduate students. Following is the list of initiates: Cliveden L. Cox, Russell A. Cain, Ewen Gillis, Charles Schwartz, Jr., Ivor Jones, Herman J. Schroeder, Leonilda T. Mozzone, Carl W. Kraft, Ralph E. Harriger, Gordon Ferguson and Louis Fischer.

Sigma Chapter was installed April 24th at Western Reserve University, Cleveland, with Dr. F. J. Bacon, a member of the staff and a charter member of Eta Chapter, in charge of the services. Six members of the teaching staff, four graduate students and ten undergraduates were initiated. Dean Edward Spease, Neil T. Chamberlin, Edward D. Davy, Paul R. Hudson, R. M. Porter were the staff members; students were Cecilia S. Kranaskas, Earl E. Hester, James S. Neely, Robert P. Stockhaus, Wanda J. Baygrowitz, E. A. Celke, R. O. Farris, Ruth L. Kotershall, Gustav C. Kostell, George H. Gerlach, Harry F. Valway, Donald L. Kaufhold, Russell B. McArtor and Robert A. Fitch.

Tau Chapter was installed, April 14th, at South Dakota State College, at Brookings, by Dr. Karl Rang, a member of the staff there and a charter member of Eta Chapter. Fourteen members were initiated, four members of the staff and ten students. Dean E. R. Serles, Floyd J. LeBlanc, Clark T. Eidsmoe, Gerald S. Dorn, Harold J. Lynch, Nial E. Tidball, Erma D. Walberg, Eleanor M. Pitts, Herbert J. A. Richter, Eldon B. Erickson, James N. Etteldorf, Harold L. Tischer, Ferdinand H. Fritsche and A. Orville Peterson.

All of the new chapters have elected officers who will carry on the activities of the Society next year.

The roll of chapters with their locations is as follows:

Alpha, U. of Michigan, Ann Arbor
Beta, Ore. State College, Corvallis
Gamma, U. of Oklahoma, Norman
Delta, State U. of Iowa, Iowa City
Epsilon, State College of Washington, Pullman
Zeta, Alabama Polytechnic Institute, Auburn
Eta, U. of Wisconsin, Madison
Theta, U. of So. California, Los Angeles
Iota, U. of Florida, Gainesville
Kappa, N. Dakota State College, Fargo
Lambda, Medical College of Virginia, Richmond
Mu, U. of Minnesota, Minneapolis
Nu, U. of Texas, Austin
Xi, U. of North Carolina, Chapel Hill
Omicron, U. of Maryland, Baltimore
Pi, No. Pacific College of Ore., Portland
Rho, U. of Washington, Seattle
Sigma, Western Reserve U., Cleveland
Tau, So. Dakota State College, Brookings.

The officers of the Grand Chapter are: *President*, Dr. Glenn L. Jenkins, University of Maryland, Baltimore; *Vice-President*, Dr. Franklin J. Bacon, Western Reserve University, Cleveland; *Treasurer*, Dr. B. V. Christensen, University of Florida, Gainesville; *Secretary*, Miss Zada M. Cooper, State University of Iowa, Iowa City.

"While it may be true that it requires no especial skill to sell a commonly used, a patent or a proprietary medicine, yet because they are articles to be consumed by and affect the health of the human being, their sale should be regulated in order to prevent their misuse and in order to prevent the seller from making false therapeutic claims relative thereto. No articles intended for or sold under the guise of medicine should be handled or sold except under the strict supervision whether sold by the dose or in the original package."—Judge Chester A. Batchelor.

LEGAL AND LEGISLATIVE.

POLICY OF THE NEW BUREAU OF NARCOTICS.*

"It has been the policy of the new Bureau of Narcotics to direct major enforcement effort toward detecting and preventing, *first*, the smuggling of narcotic drugs into the country and, *second*, the interstate distribution of such illicit narcotics as may have escaped detection at ports and borders. This policy contemplates, of course, the active and continuous coöperation of the state authorities in controlling the retail illicit traffic within their borders as well as in the treatment and cure of their own drug addicts.

"It is desired to urge the importance of securing such state coöperation and I wish to assure on behalf of the Bureau that its representatives have been and are ready and willing to lend all possible aid to the state authorities in this connection.

"As an illustration of the measure of efficiency of the new policy, Federal officers seized from illicit traffic during 1930, of morphine alone, 26,492 ounces, or more than seven times as much of this particular drug as was seized under the former enforcement policy during the calendar year 1929.

"It is a fair estimate that the average daily dosage of a drug addict equals six grains of morphine, or an annual dosage per addict of 2190 grains. At this rate, the seizure of morphine alone during the calendar year 1930 removed from the illicit market the annual dosage of 5292 narcotic drug addicts.

MAIN SUPPLY SMUGGLED.

"The principal supply of narcotics for the illicit market in this country is represented by the quantities smuggled or unlawfully introduced into the United States from abroad. These drugs appear to be readily procurable in certain foreign manufacturing countries, and there can be no doubt that there exists abroad at least a substantial over-production, or manufacture of narcotics in excess of the world's medical needs.

"Consequently, a conference has been called at Geneva in May 1931, to consider a plan or a convention for the limitation of manufacture to that sufficient for the world's medical needs. To arrive at a conclusion which will be satisfactory to all parties and at the same time will represent an effective and lasting restriction of drug manufacture to the purpose stated involves the consideration of many perplexing questions but it is the hope of all who are interested in the solution of the great humanitarian problem of stamping out narcotic drug addiction that such an international agreement will finally be reached, and made effective."

* Parts of an address by Commissioner Harry J. Anslinger.

CONFERENCE ON THE LIMITATION OF THE MANUFACTURE OF NARCOTIC DRUGS.

The Conference on the Limitation of the Manufacture of Narcotic Drugs will meet in Geneva, May 27th. It is stated that this conference will not only discuss plans for directly limiting the quantities of opium and coca leaf derivatives to be manufactured but will also consider measures for widening the scope of the existing control of distribution and for rendering that control stricter and more effective, in view of the altered conditions which will have to be made when the quantities manufactured are reduced.

COPIES OF PERMITS TO BE POSTED IN VEHICLES TRANSPORTING INTOXICATING LIQUORS.

Section 1816, Prohibition Regulations No. 2, requires that "wherever liquors are transported other than by rail there shall be posted in or on the vehicle of transportation, or be in the possession of the person in charge thereof, a duly certified copy of the basic permit under which such transportation is authorized." This section is construed by the authorities to require that trucks used by wholesale druggists in the delivery of liquors shall have posted in or on them duly certified copies of basic permits, or that such copies shall be at all times in the possession of the drivers thereof. The regulations further provide that the "absence of such copy shall be prima facie evidence that the liquor is being illegally transported and justification for the detention of such vehicle and liquors."

The necessity for complying with the above requirements is further emphasized by the fact that in the latest draft of the revision of Regulations No. 2, prepared by the Government experts, Section 1816 is reproduced practically without change.

COLONEL ROBERT U. PATTERSON APPOINTED SURGEON GENERAL U. S. ARMY.

President Hoover on May 12th approved the recommendation of Secretary Hurley for the appointment of Colonel Robert U. Patterson of the Medical Corps to be Surgeon General of the Army, with the rank of Major General. He was appointed for four years to succeed Major Gen. Merritte W. Ireland, who will retire May 31st.

Colonel Patterson, a Canadian by birth, was appointed Assistant Surgeon in 1901 from Maryland. He served in the Philippine Islands for nearly three years and earned two citations for gallantry in action.

ENFORCEMENT OF FOOD AND DRUGS ACT IS AIDED BY LARGER APPROPRIATION.

"The Federal Food and Drug Administration plans no change in regulatory policy but will follow, in its enforcement of the Food and Drugs Act, procedure already well established," says W. G. Campbell, Director of Regulatory Work, U. S. Department of Agriculture. "The increase of $181,973 in working funds made available to the Administration for the fiscal year 1932, will be used," says Mr. Campbell, "to augment enforcement facilities and personnel, and to initiate regulatory control in certain fields." "An expanded control program," he says, "will entail change neither in administrative procedure in enforcing the act, nor in what enforcing officials conceive to be the philosophy of that act."

"Recent increases in the number of criminal prosecutions brought by the department against violators of the national pure food law do not indicate modification of the policy of the Administration," Mr. Campbell said. Explaining that the primary purpose of the Administration is not to multiply legal actions through seizure and criminal prosecution, but to protect the public and, incidentally, the honorable manufacturer, by preventing the sale and shipment interstate of adulterated and misbranded foods and drugs. The increase in the number of criminal prosecutions instituted against violators in recent months he attributed to the fact that enforcement procedure has been speeded up by added working funds granted by Congress. An appropriation increase for the fiscal year 1931, he said, made possible more adequate coverage of the food and drug fields, and the substantial addition to funds which will be available during the fiscal year 1932 will naturally bring about further corrective actions. "Change in the food and drug industries is constant," said Mr. Campbell. "New products and new operators are always appearing, making imperative progressive expansion of Food-and-Drugs-Act-enforcement facilities."

OPIUM TRADE AND WAR IN CHINA.

The city of Ichang, which is at the lower end of the famous gorges of the Yangtse River and roughly 1000 miles from Shanghai and the sea, is to-day one of the greatest opium-handling ports in the world, and officialdom and militarism hereabout look to opium revenues for most of their support.

Chungking, nearly 1400 miles from the sea and the head of steam navigation on the Yangtse for all except large launches, gets first profit from opium grown in the interior of Szechuan—a province larger than France and with a population estimated at from 50,000,000 to 60,000,000. The large city of Wanhsien, half way down-river between Chungking and Ichang, levies its own toll on shipments originating at Chungking and besides obtains a large revenue from poppies grown between Wanhsien and Chungking.

DRUG STORES IN GERMANY.

The total value of German prescription drug store business, according to official German statistics, amounts to $92,000,000 annually. This figure accounts only for prescription drug stores (Apotheken) which in Germany form a distinct branch of business dealing exclusively in medicines. There were 6446 "apotheken" in Germany in 1927, with an average annual turnover of $14,160. About $42,000,000 worth of annual sales represented deliveries to sickness-insurance societies and their members. (Consul General W. L. Lowrie, Frankfort-on-the-Main.)

FIRST AID IN FRANCE.

Several years ago a French pharmacist was requisitioned by the municipal authorities of Grenoble to attend a wounded man. The pharmacist refused to do so, and the case was taken into court, where judgment was rendered against him. Seemingly the case was to try out the legality of giving first aid in pharmacies.

BOOK NOTICES AND REVIEWS.

Die aetherischen Oele, von E. Gildemeister und Fr. Hoffmann. Dritte Auflage von E. Gildemeister. Bearbeitet in Auftrage der Schimmel & Co. Aktiengesellschaft, Miltitz bei Leipzig. Dritter Band, pp. XXXI, 1071, mit sechs Karten und zahlreichen schwarzen und bunten Abbildungen. Verlag der Schimmel & Co. Aktiengesellschaft, Miltitz bei Leipzig (Fuer den Buchhandel: L. Staackmann, Leipzig), 1931. Price $9.50.

Do. *Register Band*, pp. 124, 1931. Price $1.50.

With the publication of the index volume, Dr. Gildemeister's task has been completed once more. May he, in his advanced years and in his home on the border of the Harz mountains, enjoy the well-earned rest. To Schimmel & Co., in spite of the reverses which all Germany has suffered and from which she is still suffering to an extent that we in the United States can scarcely conceive, we are indebted for having financed this monumental scientific undertaking. The very sight of the four volumes in their attractive binding is a delight to the eye. Supplemented by the volume of C. v. Rechenberg's "Einfache und fraktionierte Destillation in Theorie und Praxis" (1923, a volume of XV—814 pages) and by the annual reports culminating in the "Jubilæums Ausgabe" (1929, pp. 327 containing four chapters of historical content and sixteen original contributions) of the "Bericht der Schimmel & Co. Aktiengesellschaft, Miltitz Bz. Leipzig ueber aetherische Oele, Riechstoffe, etc.," this set of books constitutes a library that possibly has not its equal in the literature on phytochemical technology or any other technology or branch of chemistry.

If the outward appearance of the series pleases the eye, the contents are no less satisfying to the scientist in search of information in this particular field. It is a little over three decades that the first edition made its appearance. An indication of the growth of this branch of phytochemistry may be had by a comparison of the several editions.

It will be seen that in little more than three decades, the number of volatile oils isolated and studied has trebled. What is more, our knowledge of the older oils has increased proportionately.

If in the early days of the life work of Wallach (the messiah of the terpenes as Flueckiger designated him, the master who has recently passed away) the revelation of the structure of the hydroaromatic "terpenes and camphors" did so much to bridge the chasm between aliphatic and aromatic and thereby contributed to do away with that pernicious dualism in organic systematics, our increasing knowledge of the occurrence of these substances in an ever-increasing number of plants, constitutes one of the most valuable contributions to the biochemistry of to-day.

That this knowledge of an important group of plant products has also made possible numerous contributions to the science and art of perfumery is but an incident, though a very important one.

Great as has been the progress during the life time of the writer, the worker in this field recognizes more than anyone else that the surface has been but scratched. If more than thirteen hundred oils have been distilled and studied, this is but the beginning. But our knowledge of the volatile substances of plants is increased in an even more important direction. One has but to compare the chapter on sesquiterpenes in the three editions to realize the enormous advance that has been made in the

Table I.

Edition.	Year.	Vols.	Oils.	Number of pages.	Cuts.	Maps.	Illustrations.
1st	1899	1	422	V, 919	75	4	
2nd	1910 (I)			VIII, 697	75	2	
	1913 (II)			XVIII, 713	53	4	
	1916 (III)			XVIII, 836	52	5	
	Total	3	953	**XLIV, 2246**	180	11	
3rd	1928 (I)			XVI, 864	78	2	..
	1929 (II)			XXIII, 959	56	9	7
	1931 (III)			XXXI, 1071	59	6	9
	1931 (Index)			124			
	Total	4	1371	**LXX, 3018**	193	17	16

structural interpretation of these complex compounds which for so long a time baffled the organic chemist. But here also, in spite of the progress, only a beginning has been made, as becomes apparent from the large number of the numerous isomers $C_{15}H_{24}$ still in the lumber chamber. As to the groups of diterpenes, triterpenes and polyterpenes, we have reached a stage comparable to that of the sesquiterpenes a generation ago.

Great progress has been made in organic synthesis since Berthelot, in the early sixties of the past century, published his "Chimie organique fondée sur la synthese" and since Kekulé gave expression to his structural theories. To-day the pendulum seems to have swung in the other direction once more. We are no longer interested as intensely as formerly in mere synthesis, but we use it as a tool in proving the structure of compounds that interest us biochemically first and foremost.

Fortunate, indeed, is the age in which theory and practice combine to solve its problems.—E. K.

A. Gamir, *Farmacologia de la Digital, Editorial Paracelso;* Madrid, 1931; 308 pages. Price 7 pesetas. Published by A. Gamir. This beautifully printed monograph should appeal to all those who are interested in the pharmacology of digitalis whether they be pharmacologists, pharmacists or clinical practitioners. The work is a monograph sponsored and paid for by A. Gamir, who is a prominent pharmaceutical philanthropist occupying in Spain a position not unlike that of Dr. H. S. Wellcome in England. This gentleman is evidently anxious to promote the advancement of pharmacy and materia medica in Spain and for that reason has engaged the coöperation of scientific specialists for the compilation of the present volume. Judging from the prologue written by Dr. Obdulio Fernandez, who is professor of chemistry on the pharmaceutical faculty of the University of Madrid, the object of the monograph is to bring together in convenient form all the salient facts concerning digitalis from the earliest times to the present day for the use of pharmacists and physicians; and the author has certainly succeeded in writing a most interesting informative treatise on the subject.

The work begins with a chapter on the history of digitalis and in this connection does not content itself merely with citing the classical work of Withering but also includes references to other worthies who worked with foxglove from the earliest day until now; and mention is made of such men as Stokes, Cullen, Farriar, Fowler, Salmon, Haase, Homolle, Walz, Schmiedeberg, Kiliani and the more recent investigators, Windaus, Kraft, Cloetta, Magnus, Cushny and others. Chapter II, entitled, *Fitologia*, is really a botanical treatise, covering 12 pages of text, on various species of digitalis. Chapter III introduces a newly coined word, "*Farmacoergasia*," which deals with the culture of the foxglove, its collection, drying of the leaves and conservation; and Chapter IV is devoted to the pharmacognosy, both microscopical and chemical. A fifth chapter, embracing 32 pages, deals with the materia medica of various preparations of digitalis. In Chapter VI fourteen pages are devoted to the pharmaceutical chemistry of digitalis leaf and the active principles contained therein. This chapter is very much up-to-date and contains a great deal of useful information for those interested in the chemical aspects of digitalis and related bodies. The researches of Kiliani, Windaus, Cloetta, Schmiedeberg and a host of other original workers in this field are succinctly set forth and should furnish a convenient starting-point for further researches along this line. Chapter VII is devoted to the pharmacology proper—that is, to the pharmacodynamics—of digitalis and deals with the absorption of the drug, its elimination, its effect on the heart, blood vessels, kidneys, respiration and various other physiological functions of the body as well as with the cumulative effects of the digitalis glucosides. Chapter VIII, embracing 25 pages, is a strictly pharmacotherapeutic treatise on the clinical uses of digitalis, discussing those clinical conditions in which digitalis is indicated and others in which it is contraindicated. Chapter IX devotes 50 pages to a detailed description of the various methods of digitalis assay. The pharmacologist and the pharmacist engaged in bioassay will find this chapter of special interest as it discusses all the various methods employed in assaying digitalis both by chemical and by physiological means. Here are described not only the standard and older methods of digitalis assay but also the more recent innovations in this field. The standard frog and cat methods are given in full and include comments on the work of the International Committee on Digitalis Standardization and the statistical researches of Lind van Wijngaarden. Among the most recent contributions on the subject included in this chapter are references to the Knaffl-Lenz method of

digitalis assay, studies with the electro-cardiagraph, Hanzlik's tests on the emetic effect for pigeons and the phytopharmacological methods of Macht and Krantz. Posology, or dosage, is discussed in Chapter X and here again the reader is struck by the author's acquaintance with the most recent views on the subject. Thus, for instance, full information is given in regard to the views of Eggleston, Fraser, Pardee, Mackenzie and de Josué. Chapter XI is devoted to toxicology and includes an exhaustive treatise on the various chemical and pharmacological methods of detection of digitalis in cases of poisoning. A well selected bibliography completes this valuable monograph.

A review of the book would not be complete without a word of unstinted praise for its exceptionally pure, clear and elegant Spanish and the excellent literary style of the work wherein the author reveals not only his familiarity with the subject but also his skill in *belles-lettres*.—DAVID I. MACHT.

Therapeutics, Materia Medica and Pharmacy. The special therapeutics of diseases and symptoms, the physiological and therapeutical actions of drugs, the modern materia medica, official and practical pharmacy, prescription writing and antidotal and antagonistic treatment of poisoning. By SAMUEL O. L. POTTER, A.M., M.D. Fifteenth edition, revised by R. J. E. Scott, M.A., B.C.L., M.D., Editor of Witthaus' Textbook of Chemistry, Witthaus' Essentials of Chemistry and Pharmacology, Hughes' Practice of Medicine, "The Practitioners Medical Dictionary," "Gould's Medical Dictionary," "Gould and Pyle's Cyclopedia of Medicine and Surgery," etc. Published by P. Blakiston's Son & Co., Inc., Philadelphia. About 1000 pages. Price $8.50.

Former editions of this well and favorably known work have been reviewed in these columns, the last one being the 14th edition and reviewed on page 614 in the July JOURNAL for 1926. The fact that it has been deemed necessary to prepare another revision, speaks for the favorable reception the prior edition has received. In the fifteenth edition no change has been made in the general plan and principles originally adopted by the author, hence the statements made relative thereto in the previous review are applicable. Much new material has been added and some statements have been modified, so that few of the articles in Parts I and III remain as they were. The official preparations of the Materia Medica have been brought into conformity with U. S. P. X and the fifth edition of the National Formulary.

A general idea of the contents is given in the following:

The Introduction deals with drugs in a general way—pharmacology, pharmacy, materia medica and therapeutics. The constituents of organic drugs are discussed under respective headings and the classification of medicines is alphabetically arranged. This information is followed by a discussion of the various methods of the administration of medicines, their dosage, accumulative action, and this is followed by memoranda on other effects than those expected by the prescriber.

Part I deals with materia medica and therapeutics and the arrangement is alphabetical.

Part II is concerned with pharmacy and prescription writing which deals with pharmacopœias and dispensatories, weights and measures, and how these are used in prescriptions, incopamtibilities which may result, extemporaneous and official pharmacy; the various preparations, under respective headings are given in alphabetical arrangement.

Part III is concerned with special therapeutics, including also toxicology. The appendix includes Latin in the designation of preparations and in writing prescriptions, legislation applying to the prescribing and dispensing of narcotics; an alphabetical list of preparations and a series of useful tables.

Drug Store Business Methods. A textbook on commercial pharmacy by CHARLES W. PEARSON, A.B., M.B.A., formerly associate professor of Commercial Pharmacy of the Massachusetts College of Pharmacy, Boston, Mass. Second edition, 12 mo., 298 pages, illustrated. Cloth, $2.75 net. Published by Lea & Febiger, Philadelphia.

The first edition of this book, published in 1926, was reviewed in the JOURNAL for February 1927. There is very little change in the book, hence an extended review is not called for. One criticism might be offered in that there is not sufficient detail given to the subjects which would add practical information for the student and the same applies to the store owner. The contents of the book is divided into salesmanship, advertising, accounting for retail drug stores, business law and store management.

Synopsis of the U. S. P. and N. F. Preparations—giving Latin and English titles, synonyms, composition, method of preparation, strength and dose. By H. J. FULLER, Ph.C., Phm.B., Assistant Professor of Pharmacy at the Connecticut College of Pharmacy, formerly instructor in pharmacy, College of Pharmacy of Ferris Institute, and Professor of Materia Medica, Instructor in Commercial Pharmacy, and director of the Pharmacy and Dispensing Laboratories, Highland Park College of Pharmacy, Des Moines. Publishers, P. Blakiston's Sons & Co., Inc., Philadelphia. Price $2.00.

The author states that the purpose of this book is to supply a treatise on the official preparations of the Pharmacopœia and National Formulary in a convenient form for the study of Latin titles, English titles, synonyms, composition, methods of preparations, strength and dosage, arranged as to class of preparations. Information relative to pharmacy and pharmaceutical manufacture is given in a very brief way, but as the writer indicates, this publication is not intended for a textbook on pharmacy, but for supplementing other works on pharmacy and to that end serves a useful purpose. The preparations are also arranged in tabulated form which gives a number of the important facts relating to them. The book is convenient as a reference when brief general information only is desired. Care of the author and of the publishers is evidenced in the preparation and production of the book.

COURSE IN ESPERANTO.

Wisconsin Senate has refused by a vote of 20 to 12 to kill a bill providing that "Esperanto" be made an entrance requirement at the University of Wisconsin and that courses in the so-called international language be offered at the University. The bill later was advanced toward final passage by the Senate.

Senator Walter H. Hunt, a professor in the River Falls Normal School, spoke in favor of the measure; he said, "I had no trouble learning sentences of Esperanto and I have no grounding in foreign languages. I believe the emphasis on Latin, for example, is ridiculous. It is a dead language. I believe the University should have a course available in Esperanto for those students who want to study the language."

SOLUTION OF MAGNESIUM CITRATE.

"The Federal Food and Drugs Act specifically designates the U. S. Pharmacopœia as the legal standard for drug products sold in this country—" W. G. Campbell, director of Regulatory Work, U. S. Department of Agriculture, said, March 25th, in commenting on "a fine of $500.00 recently imposed on certain manufacturers for shipping sub-standard, adulterated and mislabeled solution citrate of magnesia in interstate commerce:" "Standards set forth in the Pharmacopœia are definite and precise and well understood by operators in the drug trade. Taking the Pharmacopœia as the measure of quality and purity of drugs, the consumer, protected by the enforcement of the food and drugs act, is assured of uniform products."

"The defendants claimed that their adulterated laxative was more palatable than the standard U. S. Pharmacopœial product," Mr. Campbell stated, "and that the shortage in contents of bottles shipped, constituting misbranding under the law, was accidental and due to inequalities in the bottles themselves. The department explained to the court that it does not make the standards for the Pharmacopœia, but is charged by the law to require compliance with them on the part of the drug trade. Marketing citrate of magnesia having a citric-acid content below that prescribed, without label designation to show that the product is not up to standard, constitutes a violation of the National pure food and drug law. Although this concern's product was labeled 'approximately 11½ fluid ounces,' (instead of 12 fluid ounces, 350 cc., the Pharmacopœial dosage), the bottles were found to contain less than 11½ fluid ounces."

"A buyer deserves to get a standard medical preparation for the price commonly paid for such an article," Mr. Campbell added. "He has the right to know the quality and character of all drugs purchased in order to be reliably governed in their use."

NEW MEXICO DRUGGISTS LOSE INSPECTOR'S BILL THROUGH VETO.

A satisfactory inspector's bill for the dentists, doctors and druggists of New Mexico was drawn up by Bernard Ruppe and E. C. Welch of Albuquerque and was passed by the Lower House and Senate through the efforts of Major Ruppe, but was pocket-vetoed by the Governor. The loss of this bill is a serious disappointment among the ranks of allied medical professions in New Mexico.